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ABSTRACT

In response to informal reports that the time limitations on the new 1978 test forms of the General Educational Development (GED) Tests resulted in some examinees having to work substantially faster than at a comfortable rate, this study was designed (1) to estimate the time required for examinees to complete the tests at their preferred rate; (2) to examine the relationship of examinee age and ability to preferred work rate; and (3) to draw conclusions concerning the suitability of the time limits. This 1980 study was conducted in 40 GED Testing Centers in Wisconsin. The proposed time limits for reading, writing and mathematics tests were 60 minutes, and for social studies and science 90 minutes. Results showed that the rate at which examinees prefer to work was related to their age, ability, and the number of high school grades completed. It was least related to scores earned on the tests. The examinee showed a wide variation in work rates, with each person's relative rate being similar for all five tests in the battery. Because a substantial number failed to complete the mathematics and writing skills tests, new, extended time limits were put into effect July 1981. Directions for test administration, and various figures illustrating test results are appended. (JAZ)

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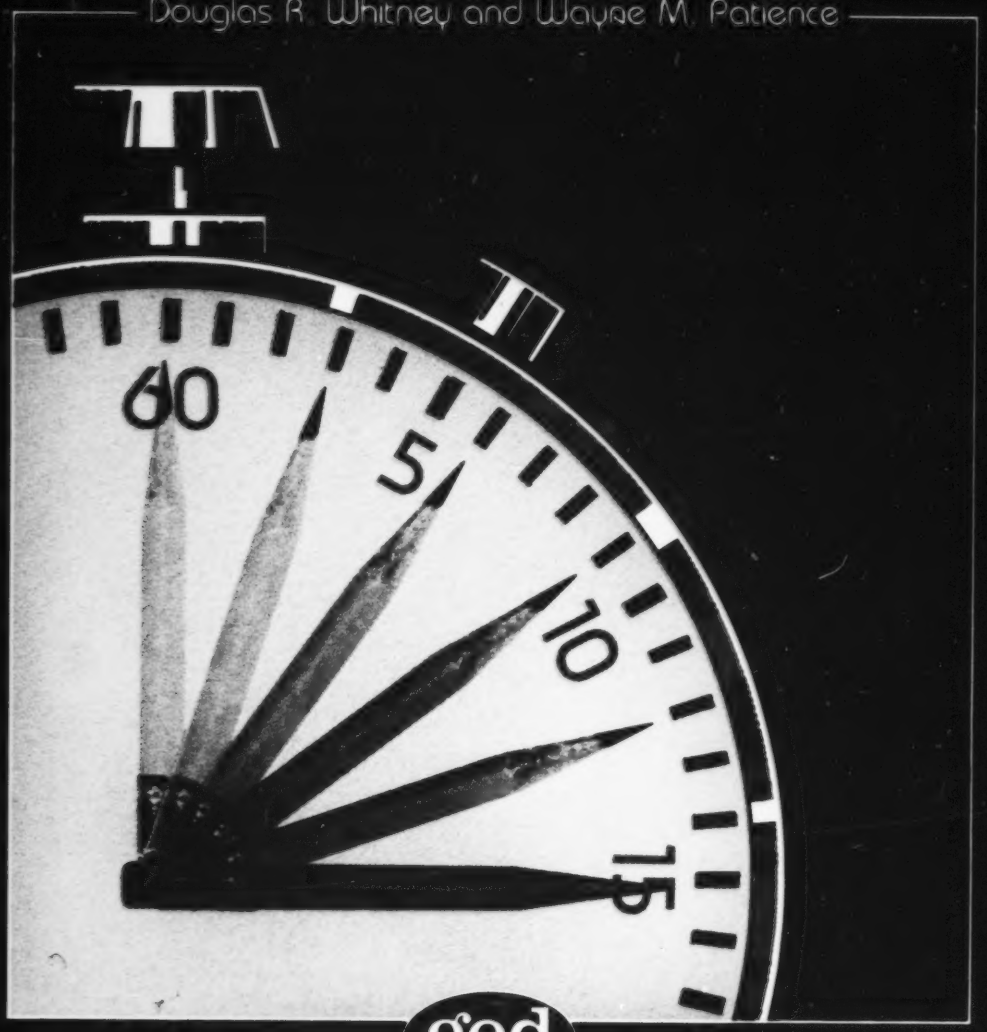
WORK RATES ON THE GED TESTS

Douglas R. Whitney and Wayne M. Patience



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GED TESTING SERVICE
RESEARCH STUDIES, NUMBER 2
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The GED testing program began in 1942 with the development of a battery of tests for U.S. military personnel who had not completed their high school studies. Today, through the GED Testing Service of the American Council on Education, the tests are administered in all fifty states, in many Canadian provinces, and in the U.S. territories. The GED testing program has offered millions of adults a "second chance" by enabling them to demonstrate that they have many of the skills they would have acquired had they been able to remain in high school.

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WORK RATES ON THE GED TESTS

Relationships With Examinee Age and Test Time Limits

Douglas R. Whitney and Wayne M. Patience

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AMERICAN COUNCIL ON EDUCATION
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ABSTRACT

After the GED Tests were revised and new tests introduced in 1978, reports from examiners suggested that a notable proportion of examinees were unable to complete one or more tests without having to work at a rate faster than comfortable. In response to these observations, the GEDTS staff conducted a study of examinee work rates on the current tests. The study, conducted at 40 Official GED Testing Centers in Wisconsin, revealed that the rate at which examinees prefer to work when completing the GED Tests was related to their age, ability, and the number of high school grades completed before leaving a traditional high school program of study. Of these, examinee work rate was least strongly related to scores earned on the Tests. To a limited extent, the most rapid work rates were shown by examinees who were younger, who earned higher scores on tests 1-4, and who had completed most of their high school program of study. Examinees of all ages, ability levels, and study levels, however, exhibited a wide variation in work rates, with each person's relative rate being essentially similar on all five tests in the battery. Because a substantial number of examinees was unable to complete the Mathematics test within the original time limits, the limits were revised to permit additional time for work. A similar, but smaller, adjustment was needed for the Writing Skills test. The new, extended time limits were put into effect July, 1981.

WORK RATES ON THE GED TESTS: RELATIONSHIPS WITH EXAMINEE AGE AND TEST TIME LIMITS

INTRODUCTION

The first editions of the Tests of General Educational Development (GED) were developed in 1942 for active duty service men and women who, upon separation from the service, could be aided in future educational endeavors by the assessment and recognition of the skills and knowledge acquired during their service experiences. The original Tests were used to certify the educational development of persons who had not, prior to entering the service, completed high school. Rather than return to a traditional high school to complete a diploma program, service men and women lacking a high school credential could take the GED Tests to demonstrate skills and thereby earn certificates indicative of an attained educational level comparable to high school graduates. It was hoped that college officials and employers would accept the test-based credentials in lieu of a regular high school diploma. They did, in fact, accept these credentials, and successful examinees were able to pursue educational and vocational objectives that had been interrupted by their war-time service.

During the 1950s, many states requested and received permission from the American Council on Education (ACE) to administer the GED Tests to civilian adults. The nature of the GED testing program progressively changed from one serving only persons in the service to one serving both military and civilian individuals. The program is now available to the non-high school graduate population in all fifty states, the District of Columbia, many U.S. territories, and many Canadian provinces and territories. The GED testing program is a cooperative activity of the American Council on Education's GED Testing Service and departments of education in the states, provinces, and territories. The GED Testing Service develops the tests, establishes the norms and standard score scales, and provides documentation for administering and interpreting the Tests. Each department of education establishes eligibility requirements for taking the Tests and minimum score requirements for earning a credential. About 2,700 Official GED Testing Centers operate in high schools, community colleges, four-year colleges, and universities.

During the forty year history of the GED testing program, the nature and purpose of the Test battery has remained essentially as originally established. The Tests were designed to measure the general skills and abilities ordinarily acquired during a high school program of study and retained after graduation. The titles of the original five tests (used from 1942 to 1978) were:

(1) Correctness and Effectiveness of Expression
(2) Interpretation of Reading Materials in the Social Sciences
(3) Interpretation of Reading Materials in the Natural Sciences
(4) Interpretation of Literary Materials
(5) General Mathematical Ability.

In the early 1970s, discussions led ACE to change the original test specifications. Committees of educators in the major secondary curriculum areas met, and new specifications were established that (1) better reflected contemporary secondary school emphases and (2) included a greater variety of source materials relevant to the daily activities of the adult examinee population. In addition to updating the test specifications the committees' recommendations reflected the fact that the volume of testing had grown to about a half-million persons annually. Specifically, the testing volume in many large Official GED Testing Centers (usually urban) required tight scheduling to meet examinee demand. The original Test battery could be completed by most examinees in five two-hour sessions, but the total administration time for the battery sometimes exceeded ten hours since additional time was given to examinees who requested it. To address problems of scheduling, studies were done on the feasibility of reducing administration time from ten to about six hours for the new tests. As a result of test development work on content and timing, new six hour test batteries were introduced in 1978. The current tests carry the titles:

(1) Writing Skills
(2) Social Studies
(3) Science
(4) Reading Skills
(5) Mathematics.

The current Tests use a standard score scale developed in a national norming study conducted in Spring, 1977 by the Educational Testing Service (ETS, 1978). Using the test results of a national sample of high school seniors, the standard score scales were developed to have a normal distribution with a mean of 50 and a standard deviation of 10 for each of the five tests.

Because GED examinees are not enrolled in nor graduated from high school, their recent test taking experience is often limited. Too, the ages of GED examinees are generally higher and considerably more varied than those of persons who typically take standardized secondary achievement and college admissions tests. A recent national sample of GED examinees in the U.S. (Malizio & Whitney, 1981) included persons ranging in age from 16 to 78. The median age was about 21 years. It is generally presumed that older persons and those who are not experienced test takers typically require more time to complete tests than do experienced and younger examinees. Therefore, special study was given to the establishment of time limits for the new GED Tests.

THE 1974 DEVELOPMENTAL TIMING STUDY

As a part of designing the specifications for the new tests, an experimental study was conducted by the Educational Testing Service (ETS). The study was intended to provide information on the rate at which GED examinees would be able to answer various item types under consideration for the new tests.

Eleven experimental tests were assembled by ETS test development personnel. Six of the tests were constructed using items taken directly from then-current GED Tests while five contained items from other sources. Those test item formats which were known or thought to have similar administration times were placed in single experimental tests. Items selected from non-GED sources were chosen because they appeared to require less test administration time than item formats currently on the GED Tests. Of course, all items were selected on the basis of their relationship to the test specifications the advisory committees were likely to recommend. (The eleven experimental tests were assembled in advance of the committee meetings.)

The experimental tests were administered to more than 1,600 GED candidates at Official GED Testing Centers in Pennsylvania, New Jersey, and New York. The eleven tests were spiralled in two sets, one set consisted of five 20-minute tests, the other of six 30-minute tests. At any given testing center only the tests of one of the time duration sets was administered. The sample of GED candidates tested was not random in the "pure" sense. However, procedures were intended to guard against sampling bias for any of the eleven experimental tests. Approximately 150 of the 1,600 GED candidates took each of the eleven tests.

Prior to the administration of the experimental tests, examinees were given black, red, and green pencils. They changed to a different pencil at ten minute intervals while taking the tests. It was therefore possible to score the answer sheets for each timing period in order to obtain partial score and attempt rate data.

The 1974 timing study data provided statistically-based guidelines for the subsequent test development process. It should be noted that the test development process considered factors other than attempt rates, expected test reliabilities, and other statistical information. Also considered were such factors as consistency with the advisory committee recommendations, relevance to the adult experiences of GED candidates, and likely interest value for GED candidates.

The number of items attempted per minute was plotted against examinee standard scores on the GED Test corresponding to the experimental form. (Examinees took the then-current GED Test battery as well as the experimental test.) A smoothed line was fitted to the data to best reflect the average attempt rate at each standard score level. In analyzing the results of the 1974 timing study, the recommended time limits for the new tests were most strongly influenced by the work rate of those examinees whose test scores were near the lowest recommended minimum score for earning a credential. An "attempt rate" was established for developmental use by identifying the average attempt rate for examinees whose standard scores were near 35. (Most states require that a minimum standard score of 35 be obtained on each test in the battery in order to earn an equivalency credential.) The attempt rate for developmental use was, as noted in Table 1, established at or below the estimated level for examinees near the standard score level of 35.

Table 1

SUMMARY DATA FROM 1974 TIMING STUDY

Experimental Item Type	Number of Items	10 min. Time Period	GED Candidate Data at Standard Score 35: Average [a] Number Attempted	Average Attempt Rate/ Minute	Devel. [b] Attempt Rate/ Minute
1. Spelling	56	1	23.4	2.3	
		2	18.6	1.8	1.5
2. Capitalization, Punctuation, and Usage	62	1	20.9	2.1	
		2	21.7	2.2	
		3	15.5	1.5	1.5
3. Effectiveness of Expression	60	1	17.0	1.7	
		2	15.7	1.6	
		3	16.8	1.7	1.2
4. Social Science Data Interpretation	20	1	6.9	.7	
		2	6.2	.6	.5
5. Reading Comprehension Social Science and Literature	40	1	11.8	1.2	
		2	11.3	1.1	
		3	10.6	1.1	.7
6. Reading Comprehension Science (I)	36	1	10.2	1.0	
		2	9.8	1.0	
		3	9.5	1.0	.7
7. Reading Comprehension Science (II)	34	1	8.7	.9	
		2	9.8	1.0	
		3	9.2	.9	.7
8. Social Science Concepts	35	1	14.2	1.4	
		2	11.2	1.1	1.0
9. Science Concepts	35	1	15.7	1.6	
		2	11.3	1.1	.9
10. Mathematics Computation	28	1	7.0	.7	
		2	6.7	.7	.5
11. Mathematics Problem Solving	35	1	11.9	1.2	
		2	9.5	1.0	
		3	8.5	.9	.8

[a] Average number of items attempted for individual time periods.

[b] Occasionally, the attempt rate for test development use was set lower than the lowest obtained attempt rate for GED candidates at the cut score. This was done when observed attempt rates showed substantial variability for candidates at the cut score and was an attempt to ensure that ample time was provided by the recommended rate for test development.

The last stage in this study was to prepare a summary chart for the test development personnel. This chart, presented here as Table 2, was based on the projected numbers of each item type needed to achieve the desired test reliability and needed to match the content specifications of the curriculum committees. Subsequently, GEDTS established 60-minute time limits for Tests 1, 4 and 5, and 90 minute limits for Tests 2 and 3. This was not done, however, until after the study reported next had been completed. In reviewing Table 2, the reader may note that the established time limits were generally a few minutes longer than the computed time required for the average examinee at a standard score 35 to complete a given test. The Mathematics time limit is the exception, but it should be recalled that the attempt rate for developmental use was lower than the lowest obtained average attempt rate for marginal scoring examinees (see Table 1). The developmental attempt rates were chosen to err on the liberal side--that is, giving marginal scoring candidates more time than would typically be required.

Table 2

GED 1974 TEST DEVELOPMENT
WORK RATE SPECIFICATIONS

GED Test	Item Type	Number of Items	Attempt Rate for Developmental Use(item/min.)	Computed Admin. Time a	Actual Limits Set
Writing Skills	Spelling	10	1.5	7	
	Capitalization and Punctuation	10	1.5	7	
	Sentence Correction	24	1.2	20	
	Usage	24	1.5	16	
	Logic and Organization	12	1.2	10	
	Total Test	80	1.365	60	60
Social Studies	Concepts	20	1.0	20	
	Data Interpretation	15	0.5	30	
	Reading Comprehension	25	0.7	36	
	Total Test	60	0.750	86	90
Science	Concepts	20	0.9	22	
	Reading Comprehension	40	0.7	57	
	Total Test	60	0.767	79	90
Reading Skills	Reading Comprehension	40	0.7	57	
	Total Test	40	0.700	57	60
Mathematics	Problem Solving	50	0.8	63	
	Total Test	50	0.800	63	60
Total Battery					360

[a] Number of items divided by attempt rate.

THE 1977 EXAMINEE TRYOUT

After developing the new test forms, but before releasing them for use, a second study was conducted involving a small sample of adult examinees. The purpose of this study was to provide a check on the tests as actually constituted for use. In this study, conducted during September and October, 1977, GED examinees in seven states completed one of the new six-hour test forms rather than the then-current 10-hour forms. About 300 examinees participated in the study (ETS, 1978).

Since, in 1977, examinees were permitted to request additional time beyond the suggested administration time, these 300 examinees were given the same opportunity. Requests for extra time were noted; forty-two persons were reported to have made such requests on one or more tests. While this suggests that 14 percent of the examinees were unable to complete at least one test within the time limits, only 5 percent of all the tests taken required additional time.

Because this study was not conducted specifically for the purpose of checking the time limits, only summary data is available relating to the topic under study here. From the results, however, it was predicted that about 95% of the examinees would be able to complete any given test within the time limits.

THE 1980 WISCONSIN WORK RATE STUDY

In 1978, when the new Tests were introduced, the GEDTS informed Chief Examiners that they should announce and use the time limits for all examinees taking the regular editions of the tests. (Examinees taking braille and audiocassette editions are permitted additional time.) During the first year or so that the new tests were in use, a number of reports were received suggesting that some examinees were unable to complete the tests without working at a rate substantially faster than was comfortable. These reports, anecdotal and lacking any degree of precision, led the GEDTS staff to plan the study reported here.

The specific goals of this study were:

(1) to estimate the time required for most examinees to complete the GED Tests working at their preferred rate,

(2) to examine the relationship of examinee age and ability levels to preferred work rate on the GED Tests, and

(3) to draw conclusions concerning the suitability of current time limits for the GED Tests.

The sample for this study included all examinees tested at 40 Official Testing Centers in Wisconsin during February and March 1980. For this period, special instructions for administering the tests were used in order to obtain the information required to study the relationship between examinees' preferred work rate and the time limits for the GED Tests. (Appendix A contains the special instructions used for the study.)

GEDTS staff decided to conduct the study at the Wisconsin Centers, rather than selecting a sample more broadly representative of all Centers, primarily due to administrative constraints. Selecting only one or a few Centers within a state to conduct a study in which extra time would be permitted would have been unfair to examinees tested in nearby centers where extra time was not provided. Accordingly, it was decided to conduct the study using all Centers in one or more states. Because the administrators associated with the Wisconsin GED program had indicated an interest in participating in a study of time limits, the study plan was developed in cooperation with Wisconsin Chief Examiners. Characteristics of Wisconsin GED examinees were found to be reasonably comparable to those of U.S. examinees as a whole. The Wisconsin Test Centers included both urban and rural locations. In addition, the percent of Wisconsin examinees meeting minimum score requirements (75.8 percent in 1979), and the average number of years of high school completed (10.1 percent in 1979) resembled those for the U.S. as a whole (68.4 percent and 10.0 percent respectively). One difference, however, which should be kept in mind when interpreting the results, was that 1979 Wisconsin examinees were considerably younger than those in the rest of the country. In Wisconsin, 47.3 percent (as compared to 35.4 percent in the U.S.) were 19 or younger. The average age was 23.1 in Wisconsin and 25.3 in the U.S. As noted in discussions that follow, adjustments were made in some analyses to account for this disparity.

In all, 40 Wisconsin Testing Centers participated in the study. A total of 2,615 examinees were tested at these Centers during February and March, 1980. Examinees recorded the starting and ending time on each answer sheet and the sheets were forwarded to GEDTS after scoring and local record keeping had been completed. GEDTS staff recorded the necessary information from the sheets and the data were prepared for computer analysis.

Due to an occasional failure to record the starting and ending times, the total time used to complete a test could not be determined for some examinees. It was, however, possible in most cases to detemine whether or not individuals completed the tests within the established time limits. In all analyses, all usable data were included.

Examinee Work Rates

As is clear from the results in Table 3, examinees showed a wide range in preferred work rates on the GED Tests. Since the mean time used is affected by extremes (that is, individuals who spent very little time and those who spent an inordinately long period), our analyses focused chiefly on the median values for time used. The median times to complete the tests ranged from about 45 minutes (on the Reading Skills Test) to 59 minutes (on the Mathematics Test), suggesting that at least half of the examinees, working at their own rate, were able to complete a test within the prescribed time limit. There appeared to be ample time beyond that used by the average examinee for most of the slower-working examinees to complete Tests 2 (Social Studies), 3 (Science), and 4 (Reading Skills). The allowance is much less for Test 1 (Writing Skills) and practically non-existent for Test 5 (Mathematics).

Table 3

WISCONSIN EXAMINEE WORK RATES
AND SCORES ON THE GED TESTS

Time Used to Complete the Tests (Minutes)

Test	Number of Examinees	Range	Mean	Standard Deviation	Median	Time Limit
Writing Skills	1261	10-140	58.3	17.9	54	60
Social Studies	1400	15-240	69.7	22.7	61	90
Science	1350	20-190	70.4	23.6	68	90
Reading Skills	1402	11-155	50.3	16.2	45	60
Mathematics	1203	15-240	65.9	21.7	59	60

Standard Scores--if examinees had been stopped at time limit

Test	Number of Examinees	Range	Mean	Standard Deviation
Writing Skills	1369	20-71	46.5	8.1
Social Studies	1538	20-79	50.3	8.0
Science	1471	20-80	51.6	7.4
Reading Skills	1528	25-78	51.4	8.1
Mathematics	1335	20-78	47.9	7.0

Standard Scores--unlimited time

Test	Number of Examinees	Range	Mean	Standard Deviation
Writing Skills	1368	20-71	47.5	7.6
Social Studies	1538	20-79	50.6	7.7
Science	1469	20-80	52.0	7.1
Reading Skills	1527	29-78	52.0	7.9
Mathematics	1335	20-78	49.1	6.7

More specifically, as illustrated in Table 4, 84-88 percent of the Wisconsin examinees, working at their own rate, were able to complete Tests 2-4 within the time limits. Only 70 percent, however, were able to complete Test 1 at their preferred work rate; only slightly more than half (54 percent) were able to complete the Mathematics Test at their preferred rate. These results largely confirmed the anecdotal reports from the field that the Mathematics Test was the most difficult to complete within the time allowed and that the proportion of examinees unable to complete the other tests was generally small.

Table 4

PERCENT OF WISCONSIN EXAMINEES
COMPLETING THE TESTS WITHIN SELECTED TIMES

Test	Number of Examinees	Percent of Examinees Completing Test within ____ Minutes						
		30	45	60	75	90	105	120
Writing Skills	1261	3	24	70(70)	87	95	98	99
Social Studies	1400	2	11	40	68	88(88)	94	97
Science	1350	2	13	38	66	88(87)	94	97
Reading Skills	1402	8	45	84(84)	94	98	99	99
Mathematics	1203	2	12	54(57)	78	90	96	97

Note. Parenthesized values include additional examinees who, though missing an exact value for time used, could reliably be judged to have or have not used extra time. The numbers of such persons for each test (respectively) were: 99, 128, 117, 115, and 126. Underlined values represent the percent finishing within the current time limits.

Relationship of Work Rate to Examinee Age

To examine the expectation that older examinees would prefer to work at a slower rate, correlations were computed between examinee age and the number of minutes used to complete each test. These results are shown in the first five rows of column D in Table 5. For all five tests, the positive correlations (ranging from .21 for Writing Skills to .32 for Science) confirm this generalization; older examinees do, on the average, prefer to work at a slower rate than do younger examinees. These correlations, however, are not large, thus, this relationship is interpreted to be present, but weak. Inspection of the data confirmed that there were many younger examinees who worked at relatively slow rates and many older examinees who finished well within the prescribed time limits.

Because, as noted earlier, the group of Wisconsin examinees were slightly younger than 1980 examinees nationally (Malizio & Whitney, 1981), and because age and work rate were related, an attempt was made to use the results in Table 4 to estimate the pattern that might have resulted had the study been conducted on a sample more representative of the national population with respect to age. To accomplish this, the times used by Wisconsin examinees were weighted according to the proportion of national examinees of each age. In deriving these "national" estimates, of course, it was necessary to assume that Wisconsin and national examinees of identical ages would show similar work rates.

Table 5

CORRELATIONS AMONG TIME USED,
GED SCORES, AGE, AND HIGHEST GRADE COMPLETED

Variable	Block A Time Used (minutes) Test 1	Test 2	Test 3	Test 4	Test 5	Block B Standard Scores-- if stopped at time limit Test 1	Test 2	Test 3	Test 4	Test 5	Block C Standard Scores-- Unlimited time Test 1	Test 2	Test 3	Test 4	Test 5	Block D Age (years)	Block E Highest Grade Compl.
Time Used Test 1	—	.63	.64	.61	.58	-.34	-.16	-.20	-.16	-.21	-.13	-.12	-.13	-.09	-.08	.21	-.13
Time Used Test 2		--	.69	.65	.51	-.24	-.23	-.23	-.20	-.19	-.14	-.11	-.16	-.11	-.07	.23	-.18
Time Used Test 3			--	.65	.51	-.19	-.19	-.21	-.15	-.18	-.08	-.12	-.10	-.06	-.06	.32	-.18
Time Used Test 4				--	.48	-.36	-.33	-.34	-.35	-.23	-.26	-.27	-.27	-.20	-.14	.22	-.18
Time Used Test 5					--	-.18	-.11	-.10	-.03	-.23	-.05	-.07	-.05	.05	.03	.28	-.17
SS Timed Test 1						--	.71	.66	.72	.57	.95	.70	.65	.70	.55	.14	.12
SS Timed Test 2							--	.76	.77	.61	.72	.98	.75	.76	.61	.14	.12
SS Timed Test 3								--	.69	.64	.66	.75	.98	.68	.64	.03	.16
SS Timed Test 4									--	.51	.73	.76	.69	.97	.53	.17	.07
SS Timed Test 5										--	.56	.61	.63	.50	.94	-.06	.12
SS Untimed Test 1											--	.72	.67	.73	.57	.18	.10
SS Untimed Test 2												--	.76	.77	.62	.18	.09
SS Untimed Test 3													--	.69	.65	.06	.14
SS Untimed Test 4														--	.53	.21	.05
SS Untimed Test 5															--	.01	.09
Age																--	-.33
Highest Grade Completed																	--

Note. All available cases were used to compute each correlation. Sample sizes for correlation coefficients range from 741 to 1400. "SS" are standard scores.

A comparison of percents from the Wisconsin sample and the estimated national figures (Wisconsin data adjusted for age distribution differences) indicated almost no change from the values reported in Table 4. Where differences existed, none were larger than one percent. Thus, it was concluded that the Wisconsin data could be used to represent the results that would have been obtained in a national sampling.

In order to more fully understand the relationship between examinee age and work rate, the median time used was plotted for each age group. These plots are reported in Appendix B. These medians showed considerable variability (being based, for upper ages, on only a few cases), so an isotonic regression technique attributed to Brunk (Ayers, et.al., 1955) was used to "smooth" the median values and to obtain a regular, step-like line characterizing this relationship. All plots showed a pattern of uneven progression, with patterns that were distinctly nonlinear. (A linear relationship between age and time used would show many steps of about equal size throughout the age range.) In interpreting these plots, the reader is reminded that the frequencies are largest for the lower ages (the plotted values being, therefore, more reliable than those for the higher ages) and that there were often only one or two examinees at ages above 57. By superimposing a line at the established time limit, it was possible to estimate the age at which the typical examinee, working at the rate characteristic for that age, becomes unable to complete the tests working at his/her preferred rate. On the Social Studies test, these lines did not intersect in the ranges of time and age contained in the data--indicating that at least half of the examinees at any age could be expected to complete the test working at their own rate. The threshold ages (the highest age at which the median time used was less than the prescribed time limit) ranged from 26 for the Mathematics test to 39 for the Writing Skills test and 54-55 for the Science and Reading Skills tests.

Relationship of Work Rate to Examinee Ability

It was expected that high scoring examinees might use less time to complete the tests than did low scoring examinees. For these analyses, the examinees' scores on the test completed with no time limitation were used as an indicator of ability. The correlations between the time used to complete the test and the standard score earned on the test (See the diagonal of block AC of Table 5), showed only slight evidence that the expectation was well-founded. These correlations, except for a value of .03 for the Mathematics test, were generally small and negative -- ranging from -.10 for Science to -.20 for Reading Skills. On the average, high scoring examinees used less time than did low scoring examinees. Comparison of the AC diagonal values with those in Column D, however, showed that work rate was more strongly related to age than to ability.

Plots of the smoothed median values for time used by standard score level appear in Appendix C. The superimposed lines at the prescribed time limit values make it clear that, at almost any score level on Tests 1-4, examinees working at a rate typical for that score level were able to complete the test within the time limits. The exception was the Mathematics test where higher scoring examinees characteristically used more than the allotted 60 minutes. That is, even when no time limits were used, examinees earning standard scores above 50 on the Mathematics test typically used more time than did those earning scores below 50.

The attempt rates used in developing the tests (see Table 1) were intended to permit ample time for examinees whose scores were near 35 to complete the tests within the specified time limits. Data in Appendix C confirm that this goal was, in fact, accomplished. For each of the five tests, the median (smoothed) time used by examinees earning standard scores of 35 falls below the time limits set for the test; the allowances are appreciable for the Social Studies and Science tests.

Relationship of Work Rate to Highest Grade Completed

Although not a major variable of interest, the test answer sheets contained data for the years of formal schooling completed prior to taking the GED Tests. The correlations reported in Column E of Table 5 indicate that, to a limited degree, examinees who had completed more formal schooling used less time to complete the tests. Years of schooling was less strongly related to the scores earned on the tests than to the time used. A comparison of the values in columns D and E of Table 5 confirmed that age was more strongly related to work rate than was prior schooling.

Inter-relationships Among the Variables

Inspection of the correlations in Table 5 reveals a seeming paradox: although older examinees used more time, older examinees also earned higher scores than did younger examinees. The small correlations make this statement of only marginal strength, but it is clear that the relationships studied here are more complex than simple analyses can fully reveal.

Using data for 454 examinees for whom all relevant variables were available, a principal factor analysis was performed using the five time measures, the five untimed standard scores, examinee age, and highest grade completed. The results, not reported here, suggested that three factors were necessary to explain 70 percent of the common variance and that, after Varimax rotation, the three orthogonal factors showed a reasonably clear pattern of loadings. The first factor contained loadings of .71 to .81 for the five test scores and no others above .25. The second factor had loadings of .63 to .83 for the five time measures and no others above .25. The third factor loaded .65 on age and -.46 on highest grade completed and no other loadings were above .25. This suggests that neither age nor highest grade completed explains the wide variation in work rates and test scores found in this sample of examinees.

The substantial correlations among the time used to complete each of the five tests (ranging from .48 to .69) suggest that the preferred test work rate for GED examinees is more strongly related to the habits, preferences, and characteristics of the individual examinee than to any characteristics of the content or skills required on a particular test. It is generally true that, regardless of which test is taken, some examinees prefer a rate much slower than that of other examinees.

Work Rate and Time Limits

Readers should note that, although results are reported in Tables 3 and 5 for standard scores based on the number of questions attempted before the normal time limit expired, examinees were aware, from the outset, that they could have as much time as needed. Therefore, scores earned on the portions of the test completed within the time limits are not equivalent, necessarily, to those that individuals would have earned if the test had been administered under timed conditions. Unlike a timed setting, examinees were not encouraged (nor did they have any incentive) to mark all remaining questions as the time limit expired. It is also likely that some examinees experience a psychological reaction to the announcement that time limits will be enforced. This reaction might result in an increase in performance, though the opposite seems more likely. Thus, the very high correlations between scores earned on the portion completed before the time limit expired and those earned under unlimited time reported in the diagonal of block BC of Table 5 (.94 to .98) can not be taken to suggest that the existence of the time limits would not appreciably alter the ranking of examinees. Too, these correlations are confounded, because the two scores are identical for examinees completing the test before the time limit expired.

Percent Completion by Age

Although the relationship between preferred work rate and age has been discussed, the matter of establishing suitable time limits for the GED Tests has yet to be addressed. Here the publisher faces the need to strike a balance between the following extremes:

(1) No time limits: Many examinees, and many Chief Examiners, would prefer that the tests be untimed. Prior to 1978, additional time was permitted if requested by an examinee. This flexibility was warranted, it was felt, by the lack of recent school and test-taking experience of GED examinees and by their extreme variation in background, age, etc. Such an arrangement is workable in many testing Centers that serve a relatively small number of examinees each year. Under this condition, all examinees could be permitted to work at their preferred rate.

(2) Time Limits: In many large-volume Centers, administrations must be tightly scheduled and it is not possible to permit unlimited time for examinees to complete the Tests. A desire for equitable treatment suggests that time limits must be applied uniformly regardless of the location (or volume) of the test center. Too, some would interpret an examinee's use of an inordinate amount of time as reflecting below-standard achievement--regardless of the scores earned. Recent increases in the proportion of examinees age 19 and younger (GEDTS, 1980) suggest that most examinees do have recent test-taking experience.

To glean further information from the Wisconsin data, we calculated the percent of examinees at each age who completed each test within the current time limits. These values, showing marked variability, were smoothed using the isotonic regression procedure, and plotted (see Appendix D). As expected from the analysis of work rate, the percent who finished the test within the time limits at each age dropped off markedly for Tests 1 and 5, but less severely for the other tests (at ages below 60). The effects of an additional 15 minutes for Test 1 and an additional 30 minutes for Test 5 on the percent of examinees who complete the tests are vividly illustrated in Appendix E.

From inspection of the plots (not reported here) that resulted from the addition of 15, 30, 45, and 60 minutes to the existing time limits of each test, it was evident that a considerable extension would be necessary in order for nearly all older examinees to complete the tests working at their preferred rate. In fact, two-hour time limits would be required to ensure that at least 80 percent of the examinees age 50 and above could complete the tests at their preferred work rate.

Variations Among Centers

In an effort to assess the degree that additional time would effect the administration of the Tests at individual Test Centers, an analysis of the work rate and percent completing each test within the time limit at each Wisconsin Center was conducted. A chi-square analysis of the completion rates by Center (eliminating those centers with fewer than 20 examinees) showed notable differences. (All statistical tests yielded probability values less than .002.) This differential effect by Center is illustrated in Table 6.

Table 6

MEAN WORK RATE AND PERCENT COMPLETING TESTS
WITHIN ORIGINAL TIME LIMITS
BY TEST CENTER

Center No.	N	Test 1 Mean Time Used (Min)	Test 1 % Com.	Test 2 Mean Time Used (Min)	Test 2 % Com.	Test 3 Mean Time Used (Min)	Test 3 % Com.	Test 4 Mean Time Used (Min)	Test 4 % Com.	Test 5 Mean Time Used (Min)	Test 5 % Com.	Ave.[a] % Com.	Mean[b] Total Time (Min)	Mean[c] Age
320	8	47	100	56	100	58	100	46	100	56	100	100	263	48.2
340	43	57	86	72	100	75	100	48	100	56	100	97	308	25.3
180	134	47	98	66	96	64	98	46	100	51	93	97	273	20.9
30	85	78	93	--	100	108	97	70	94	78	92	95	---	22.6
200	49	49	96	51	100	49	100	40	100	55	76	94	244	17.0
400	8	42	100	71	100	77	88	52	100	60	80	94	301	36.2
530	26	50	100	62	100	75	100	55	78	57	82	92	299	31.3
230	46	56	84	69	93	70	100	47	98	61	68	89	304	26.0
130	32	52	91	62	100	63	86	42	100	64	57	87	284	24.2
370	87	53	81	61	96	61	92	47	92	62	70	86	284	23.7
460	5	57	80	68	100	73	67	45	100	55	80	85	299	34.8
600	52	66	70	74	89	75	85	54	93	68	75	82	337	29.1
500	40	54	71	59	92	62	100	44	93	59	55	82	279	21.6
440	56	59	70	66	93	70	88	51	85	70	65	80	316	21.9
435	18	53	64	54	100	63	100	47	82	66	56	80	284	26.2
450	46	61	65	66	92	65	97	45	95	66	51	80	303	23.5
290	22	57	67	61	95	63	95	41	95	70	47	80	291	25.2
170	159	56	77	68	89	72	88	49	87	65	53	79	310	28.2
90	151	58	71	77	82	73	86	50	88	64	65	79	322	26.8
390	6	56	80	78	75	68	100	41	75	59	60	78	302	21.5
20	59	56	77	72	85	77	79	52	81	74	68	78	331	26.9
560	31	62	67	74	100	69	95	50	92	76	31	77	330	27.8
150	69	57	66	69	81	71	80	50	90	61	59	77	309	25.2
430	197	58	70	70	87	68	86	49	82	64	55	76	309	23.6
120	131	58	67	67	94	69	85	50	81	67	51	76	310	25.6
240	7	72	50	75	83	68	100	44	100	62	40	75	320	32.9
220	37	57	67	76	85	80	84	50	83	64	48	73	328	25.1
160	40	64	57	67	96	72	91	54	81	71	40	73	328	23.9
250	225	59	61	71	82	70	82	52	79	66	55	72	318	23.3
80	83	66	61	74	88	74	88	52	76	72	39	70	338	28.5
580	63	55	60	70	75	70	88	50	84	69	33	70	313	27.7
210	104	57	60	78	83	73	84	56	76	72	45	70	336	26.3
420	24	63	58	72	79	58	100	52	87	63	20	69	308	22.7
380	165	67	61	75	79	73	78	54	67	71	54	68	340	----
590	57	63	67	75	85	80	75	52	80	74	32	68	343	26.5
270	29	--	60	--	80	--	93	--	92	--	12	68	---	19.4
70	56	63	54	73	77	77	68	53	88	68	45	66	333	----
410	84	68	49	69	86	76	84	62	64	76	42	65	351	----
140	57	60	52	66	89	81	71	60	58	67	40	62	334	24.8
10	24	65	62	79	46	76	75	56	64	68	44	58	344	28.6
Total	2615	58	70	70	88	70	88	50	84	66	54	77	315	

[a] Average percent completion is the average of the percent completion figures for each of the five tests.

[b] Mean battery administration time is the sum of the mean time used for each of the five tests.

[c] Mean examinee age is not reported for centers at which fewer than half the examinees reported their age.

Although the centers show a wide variation in average work rates and in completion rates, these variations were not related to either the volume of examinees tested or to the average age of examinees at the centers. (That is, none of the rank order correlations between these measures was appreciable.) Thus, variability in work rates among centers can only be attributed to other examinee characteristics or, perhaps, to factors related to the administrative instructions or conditions at the centers.

It seems clear that the degree to which extended time limits for some or all tests would result in an appreciable increase in test administration time would vary by center. From Table 6, we note that the mean total work rate for the five-test battery varies from 244 minutes to 351 minutes. thus, extending the time limits for some of the tests would extend the actual test administration time chiefly at the Centers where a high proportion of slow-working examinees take the Tests.

CONCLUSIONS

GED examinees vary considerably in the preferred work rates when completing the tests. Older candidates, on the whole, prefer to work at a slower rate than do younger examinees--although considerable variation exists within each age interval.

These results generally confirm previous anecdotal reports from Chief Examiners: A number of examinees cannot, working at a rate that is comfortable, complete the Mathematics Test within the 60 minutes now permitted. To a lesser degree, the Writing Skills Test also requires a significant number of examinees to rush in order to finish the test within 60 minutes.

Because GEDTS intends that a high proportion of examinees be able to complete the tests working at a reasonably comfortable rate, adjustments seem warranted. However, the relationship between examinee age and work rate suggests that in order to ensure that at least 85-90% of the examinees <u>at any age</u> can complete the tests at their preferred work rate, it would be necessary to extend each test's time limit to about 120 minutes. In order for approximately 85-90% of all examinees to be able to complete each test within the time limits, it would be necessary to extend the time limits for the Writing Skills Test to 75 minutes and for the Mathematics Test to 90 minutes. In view of scheduling considerations, the latter modification seems preferable.

POSTSCRIPT

Based on a discussion of these results, the Council's Commission on Educational Credit and Credentials, on May 28, 1981, increased the time limits to 75 minutes for GED Test 1 (Writing Skills) and to 90 minutes for GED Test 5 (Mathematics). These changes are expected to be in effect at all testing centers by early July, 1981.

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Ayer, M., Brunk, H.D., Ewing, G.M., Reid, W., & Silverman, E. An empirical distribution function for sampling with incomplete information. Journal of the American Statistical Association, 1955, 50, 529-549.

Educational Testing Service. The final report for a project to develop twelve new forms of the Tests of General Educational Development and to standardize the tests nationally in the United States. Princeton, N.J.: Author, 1978.

General Educational Development Testing Service. The GED statistical report, 1979. Washington, D.C.: American Council on Education, 1980.

Malizio, A.G., & Whitney, D.R. Who takes the GED Tests? A national survey of Spring 1980 examinees. (Research Studies, No. 1) Washington, D.C.: American Council on Education, GED Testing Service, 1981.

APPENDIX A

DIRECTIONS FOR TEST ADMINISTRATION

Wisconsin GED Timing Study, 1980

Prior to each test, provide each candidate with a black-lead #2 pencil and read these instructions aloud:

THIS TEST IS DESIGNED SO THAT MOST CANDIDATES CAN COMPLETE IT WITHIN

{60 minutes for Writing Skills, Reading Skills, Mathematics
90 minutes for Social Studies, Science}

IT IS TO YOUR ADVANTAGE TO WORK AT A STEADY RATE AND TO AVOID SPENDING TOO MUCH TIME ON QUESTIONS THAT MAY BE DIFFICULT FOR YOU. SINCE YOUR SCORE WILL BE BASED ONLY ON THE NUMBER OF QUESTIONS YOU ANSWER CORRECTLY, YOU SHOULD TRY TO ANSWER EVERY QUESTION -- EVEN IF YOU ARE UNSURE OF THE ANSWER. IF YOU DECIDE TO CHANGE AN ANSWER, PLEASE ERASE THE FIRST MARK THOROUGHLY.

WHEN THE {60 minutes / 90 minutes} HAS ELAPSED, I WILL ASK YOU TO STOP WORKING ON THE TEST. BECAUSE THIS TEST ADMINISTRATION IS A PART OF A STUDY ON THE FAIRNESS OF THE EXISTING TIME LIMITS, HOWEVER, YOU WILL BE GIVEN ADDITIONAL TIME TO REVIEW YOUR ORIGINAL ANSWERS IF YOU WISH TO DO SO AFTER TIME HAS EXPIRED.

BEFORE YOU BEGIN, PLEASE WRITE THE TIME YOU ARE TO BEGIN WORKING ON THIS TEST AT THE TOP OF YOUR ANSWER SHEET. WHEN YOU FINISH, PLEASE WRITE THE TIME YOU COMPLETED WORK IMMEDIATELY BELOW IT. THE STARTING TIME IS {give time}.

At the end of the time allowed for completing the test, please read these instructions to the candidates who remain:

PLEASE STOP. HAND IN YOUR PENCILS. ANYONE WHO WISHES TO HAVE ADDITIONAL TIME TO REVIEW QUESTIONS AND ANSWERS MAY DO SO NOW, BUT PLEASE USE THE RED-LEAD PENCILS I WILL PROVIDE TO MARK ANY ANSWERS YOU WISH TO CHANGE OR ADD.

IF YOU DECIDE TO CHANGE AN ANSWER, DO NOT ERASE YOUR ORIGINAL MARK BUT DRAW A LINE THROUGH THE ORIGINAL BLACK MARK WITH THE RED PENCIL {Illustrate } AND MARK THE NEW ANSWER USING THE RED PENCIL.

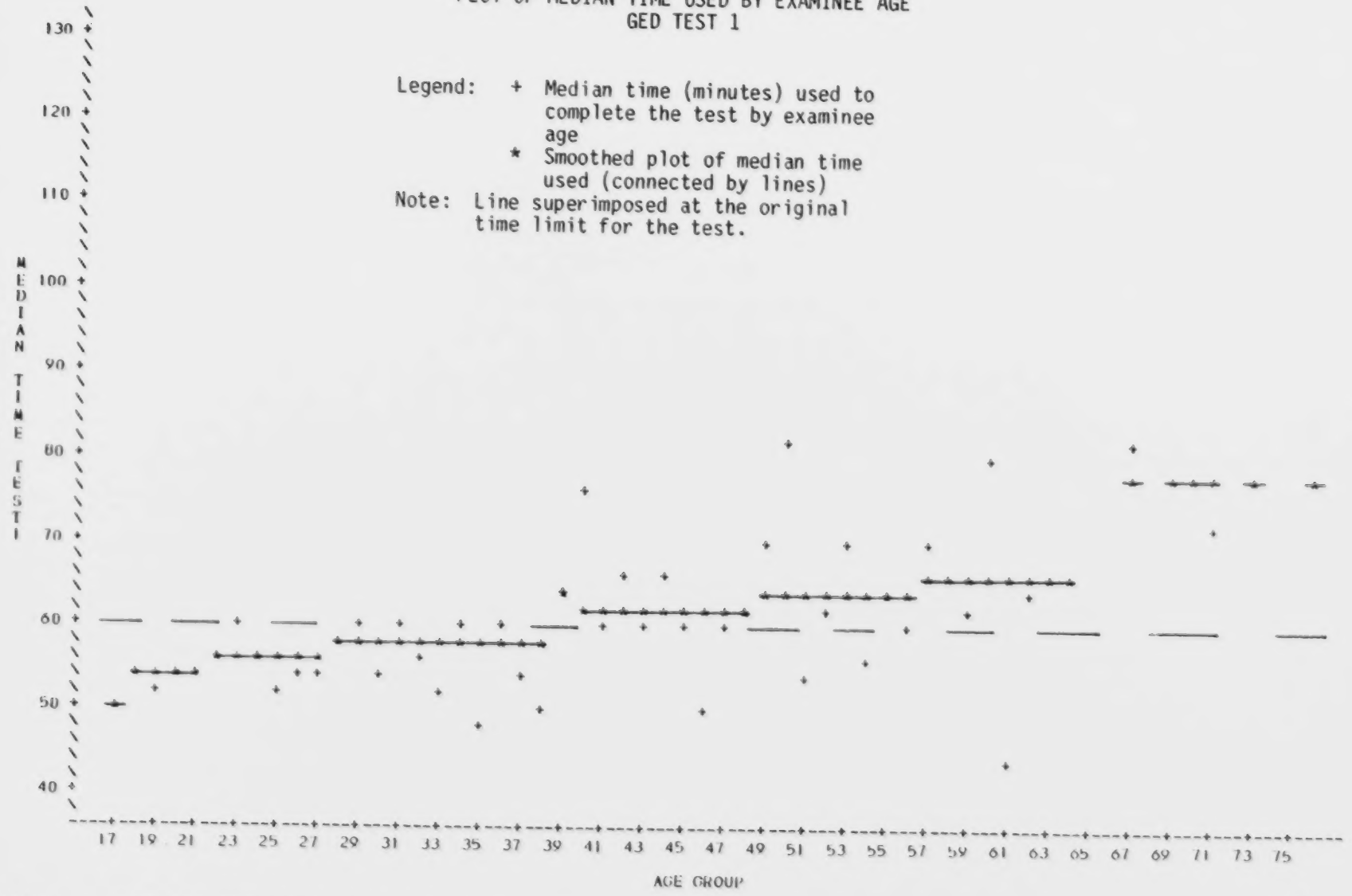
IN SCORING YOUR TEST, YOUR LAST SET OF ANSWERS (THOSE IN RED) WILL BE COUNTED AND THE BLACK MARKS WITH A RED LINE WILL BE IGNORED. WHEN YOU HAVE FINISHED WORK, PLEASE WRITE (IN RED), AT THE TOP OF THE ANSWER SHEET, THE APPROXIMATE NUMBER OF MINUTES YOU SPENT IN REVIEWING YOUR ANSWERS AFTER TIME WAS CALLED. PLEASE INDICATE WHETHER OR NOT THE EXTRA TIME WAS USEFUL TO YOU AND WHY IT WAS OR WASN'T BY ADDING COMMENTS ON THE BACK OF THE ANSWER SHEET. THESE COMMENTS WILL NOT AFFECT THE EVALUATION OF YOUR TEST RESULTS; THESE COMMENTS WILL HELP US IN REVIEWING OUR TIMING POLICIES: THEY WILL NOT BE REPORTED OR RECORDED WITH YOUR TEST RECORDS.

DRW
1/8/80

FIGURE B-1

PLOT OF MEDIAN TIME USED BY EXAMINEE AGE
GED TEST 1

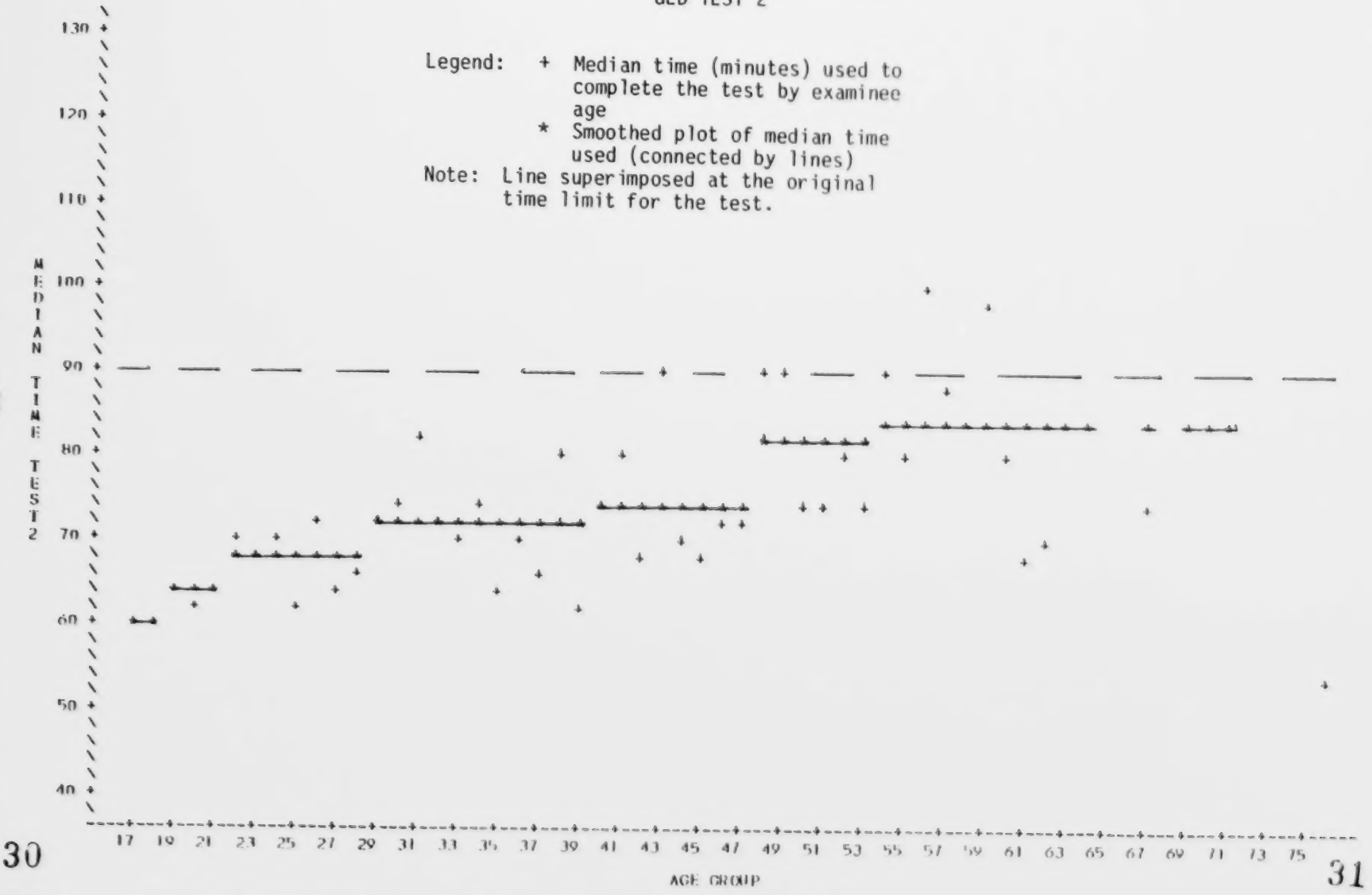
Legend: + Median time (minutes) used to complete the test by examinee age
* Smoothed plot of median time used (connected by lines)
Note: Line superimposed at the original time limit for the test.



NOTE: 7 OBS HAD MISSING VALUES OR WERE OUT OF RANGE

FIGURE B-2

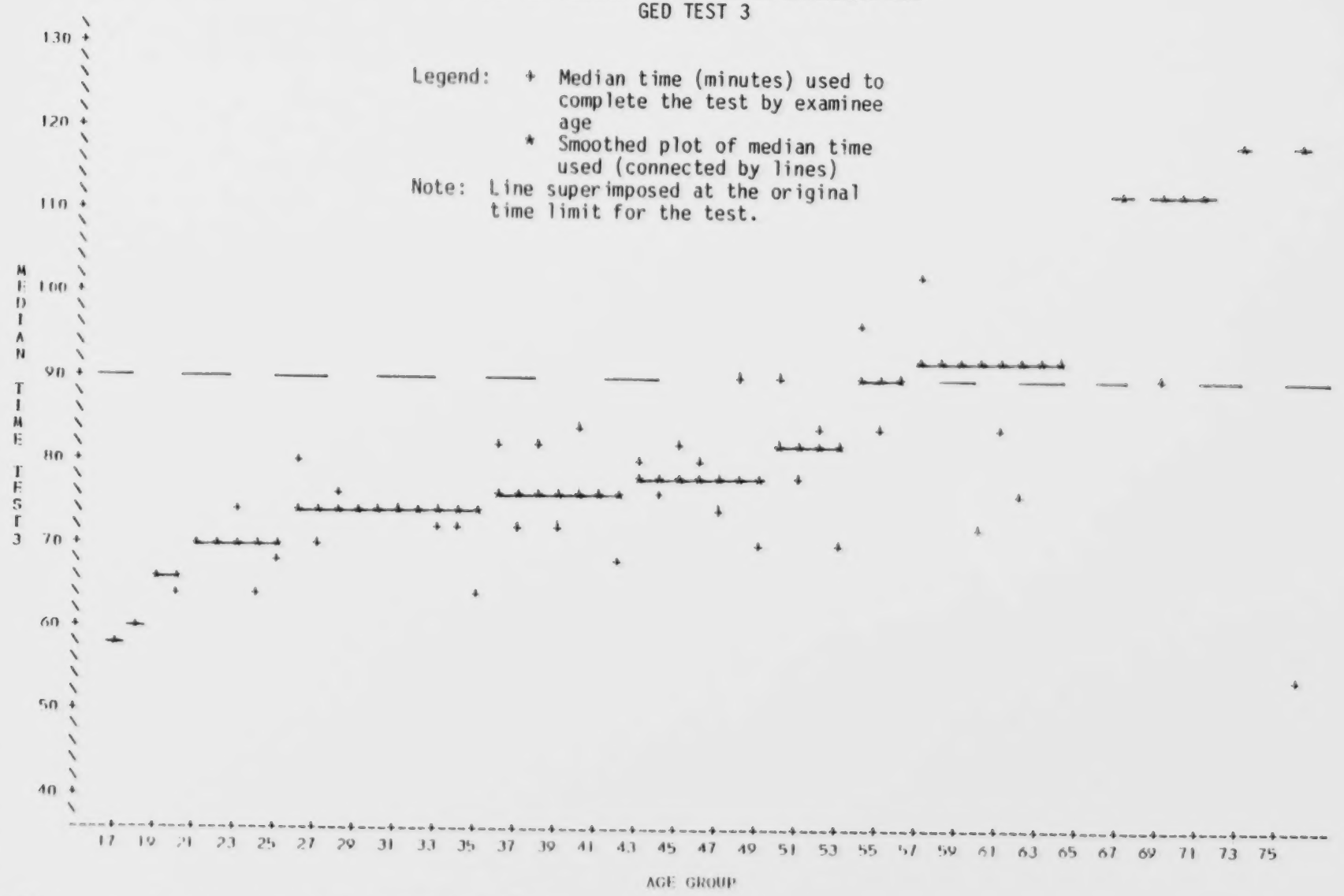
PLOT OF MEDIAN TIME USED BY EXAMINEE AGE
GED TEST 2


Legend: + Median time (minutes) used to complete the test by examinee age
* Smoothed plot of median time used (connected by lines)
Note: Line superimposed at the original time limit for the test.
MEDIAN TIME TEST 2
130
120
110
100
90
80
70
60
50
40
17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 57 59 61 63 65 67 69 71 73 75
AGE GROUP

NOTE: 9 OBS HAD MISSING VALUES OR WERE OUT OF RANGE

FIGURE B-3

PLOT OF MEDIAN TIME USED BY EXAMINEE AGE
GED TEST 3

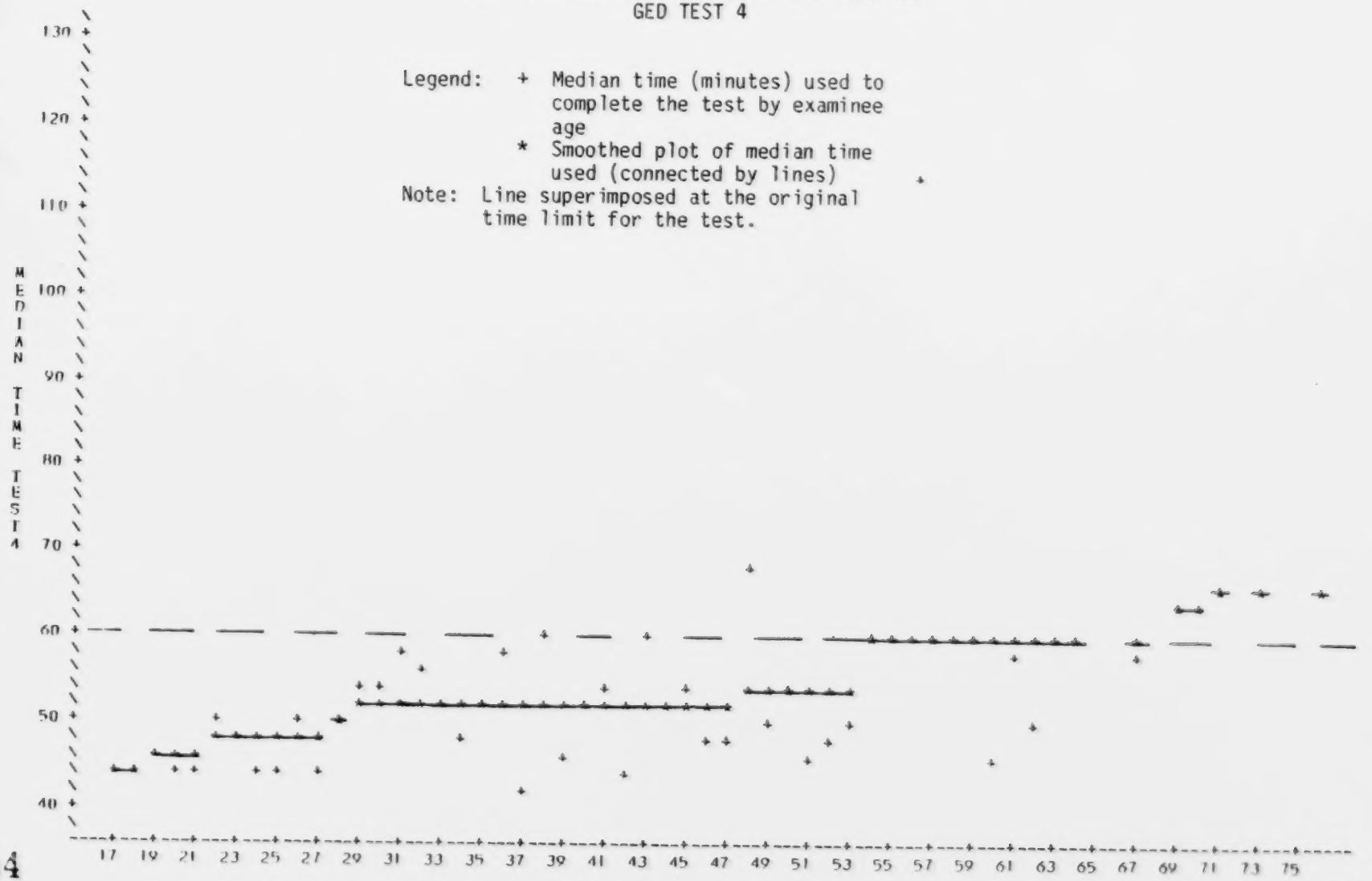

Legend: + Median time (minutes) used to complete the test by examinee age
* Smoothed plot of median time used (connected by lines)
Note: Line superimposed at the original time limit for the test.
MEDIAN TIME TEST 3
130
120
110
100
90
80
70
60
50
40
17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 57 59 61 63 65 67 69 71 73 75
AGE GROUP

NOTE: 8 ORS HAD MISSING VALUES OR WERE OUT OF RANGE

FIGURE B-4

PLOT OF MEDIAN TIME USED BY EXAMINEE AGE
GED TEST 4

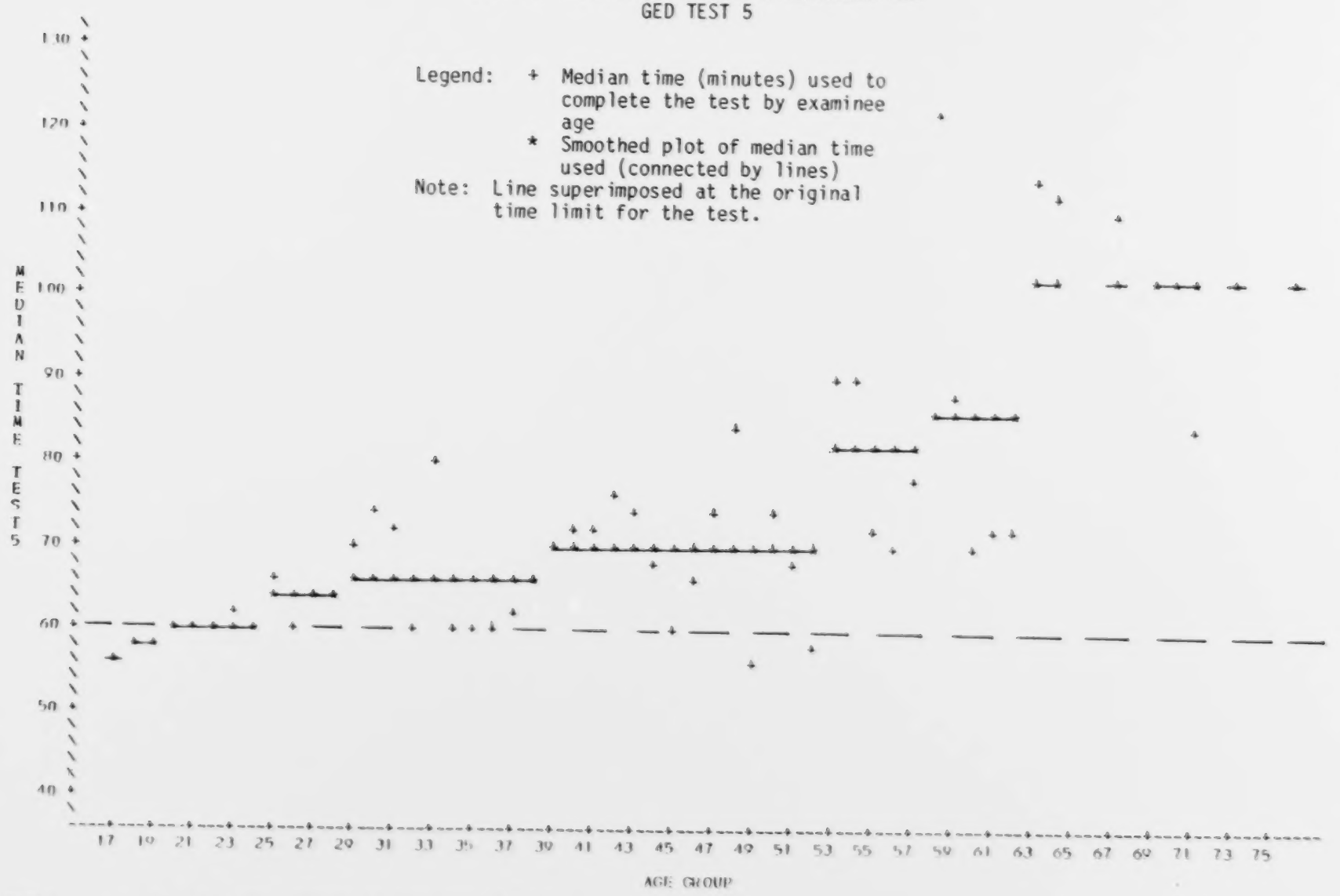
Legend: + Median time (minutes) used to complete the test by examinee age
* Smoothed plot of median time used (connected by lines)
Note: Line superimposed at the original time limit for the test.



NOTE: 6 OBS HAD MISSING VALUES OR WERE OUT OF RANGE

FIGURE B-5

PLOT OF MEDIAN TIME USED BY EXAMINEE AGE
GED TEST 5


Legend: + Median time (minutes) used to complete the test by examinee age
* Smoothed plot of median time used (connected by lines)
Note: Line superimposed at the original time limit for the test.
MEDIAN TIME TEST 5
130
120
110
100
90
80
70
60
50
40
17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 57 59 61 63 65 67 69 71 73 75
AGE GROUP

NOTE: 4 OBS HAD MISSING VALUES OR WERE OUT OF RANGE

FIGURE C-1

PLOT OF MEDIAN TIME USED BY EXAMINEE
STANDARD SCORE (UNTIMED)
GED TEST 1

Legend: + Median time (minutes) used to complete the test by examinee standard score level
* Smoothed plot of median time used (connected by lines)

Note: Line superimposed at the original time limit for the test.

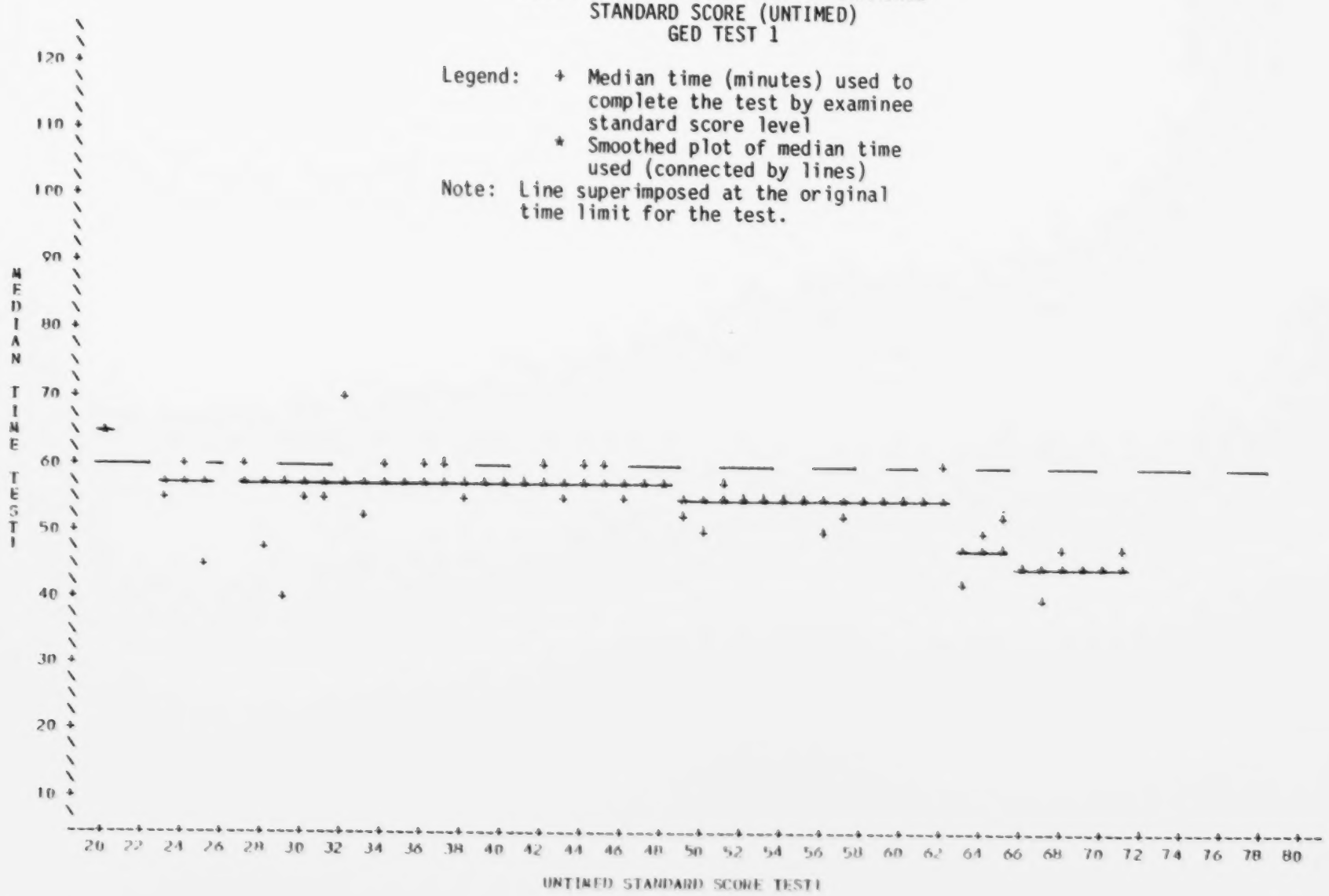


FIGURE C-2

PLOT OF MEDIAN TIME USED BY EXAMINEE
STANDARD SCORE (UNTIMED)
GED TEST 2

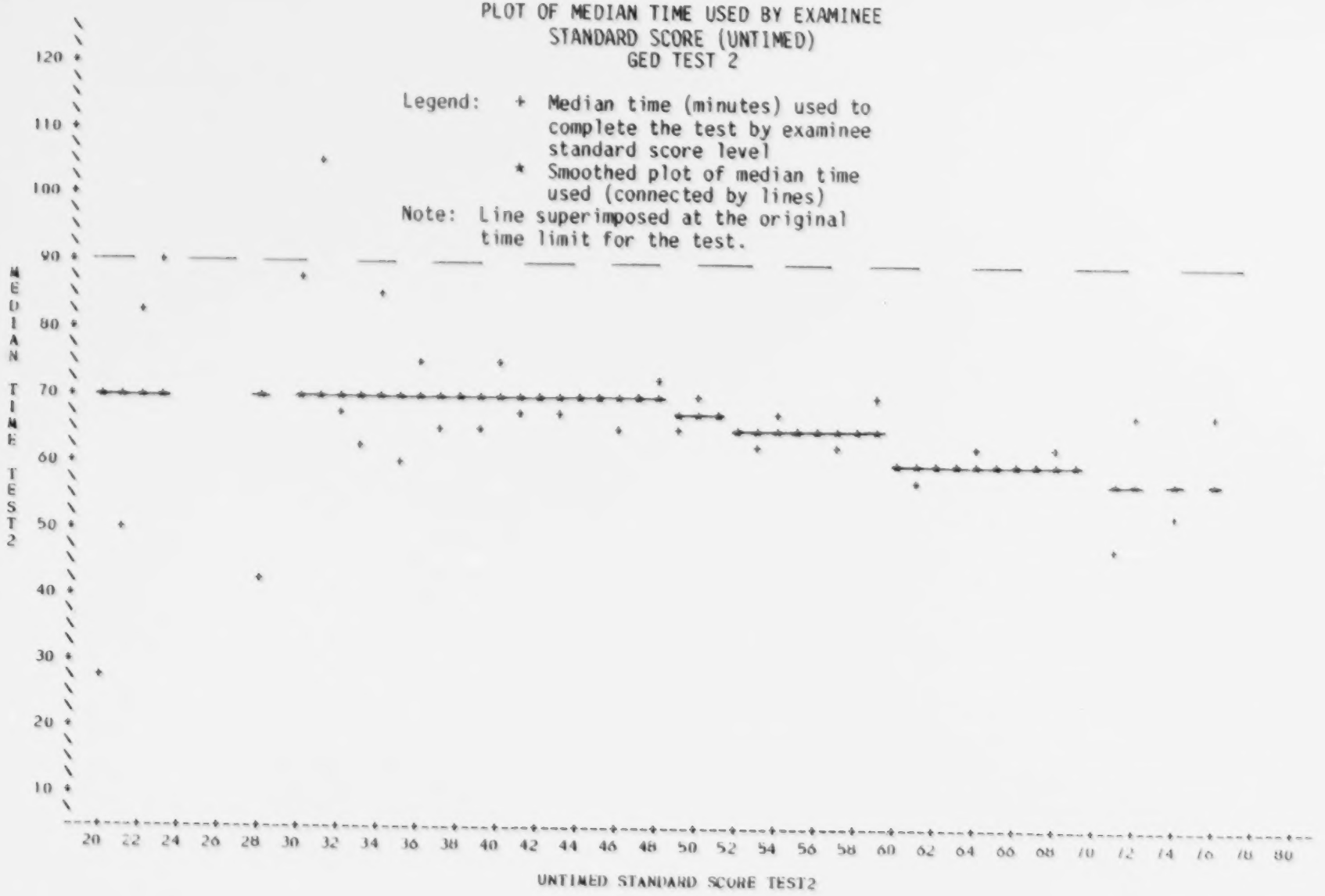
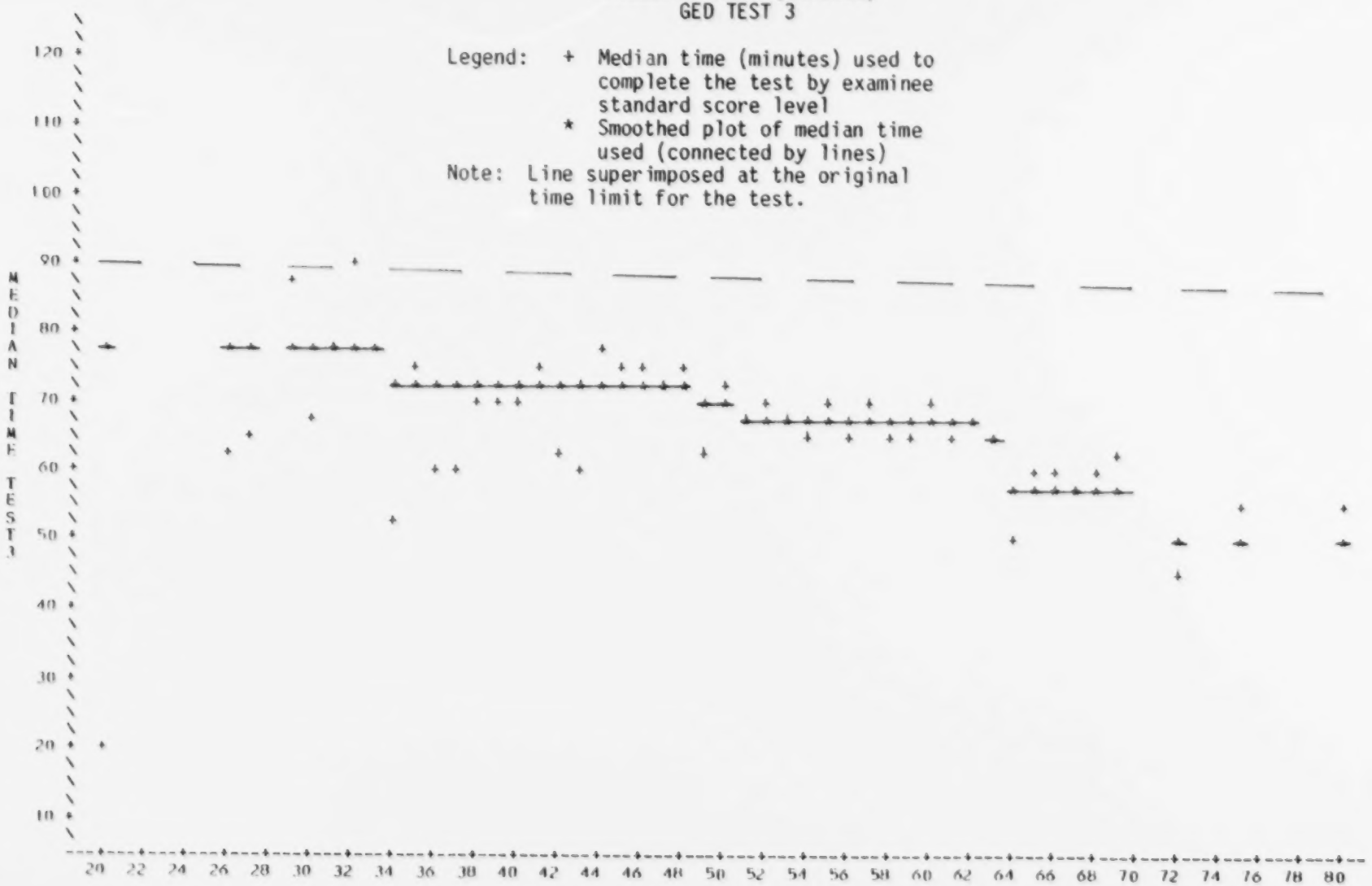

Legend: + Median time (minutes) used to complete the test by examinee standard score level
* Smoothed plot of median time used (connected by lines)
Note: Line superimposed at the original time limit for the test.
MEDIAN TIME TEST 2
120
110
100
90
80
70
60
50
40
30
20
10
20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80
UNTIMED STANDARD SCORE TEST2

FIGURE C-3

PLOT OF MEDIAN TIME USED BY EXAMINEE
STANDARD SCORE (UNTIMED)
GED TEST 3

Legend: + Median time (minutes) used to complete the test by examinee standard score level
* Smoothed plot of median time used (connected by lines)
Note: Line superimposed at the original time limit for the test.



NOTE: 1 OBS HAD MISSING VALUES OR WERE OUT OF RANGE

FIGURE C-4

PLOT OF MEDIAN TIME USED BY EXAMINEE
STANDARD SCORE (UNTIMED)
GED TEST 4

Legend: + Median time (minutes) used to complete the test by examinee standard score level
* Smoothed plot of median time used (connected by lines)

Note: Line superimposed at the original time limit for the test.

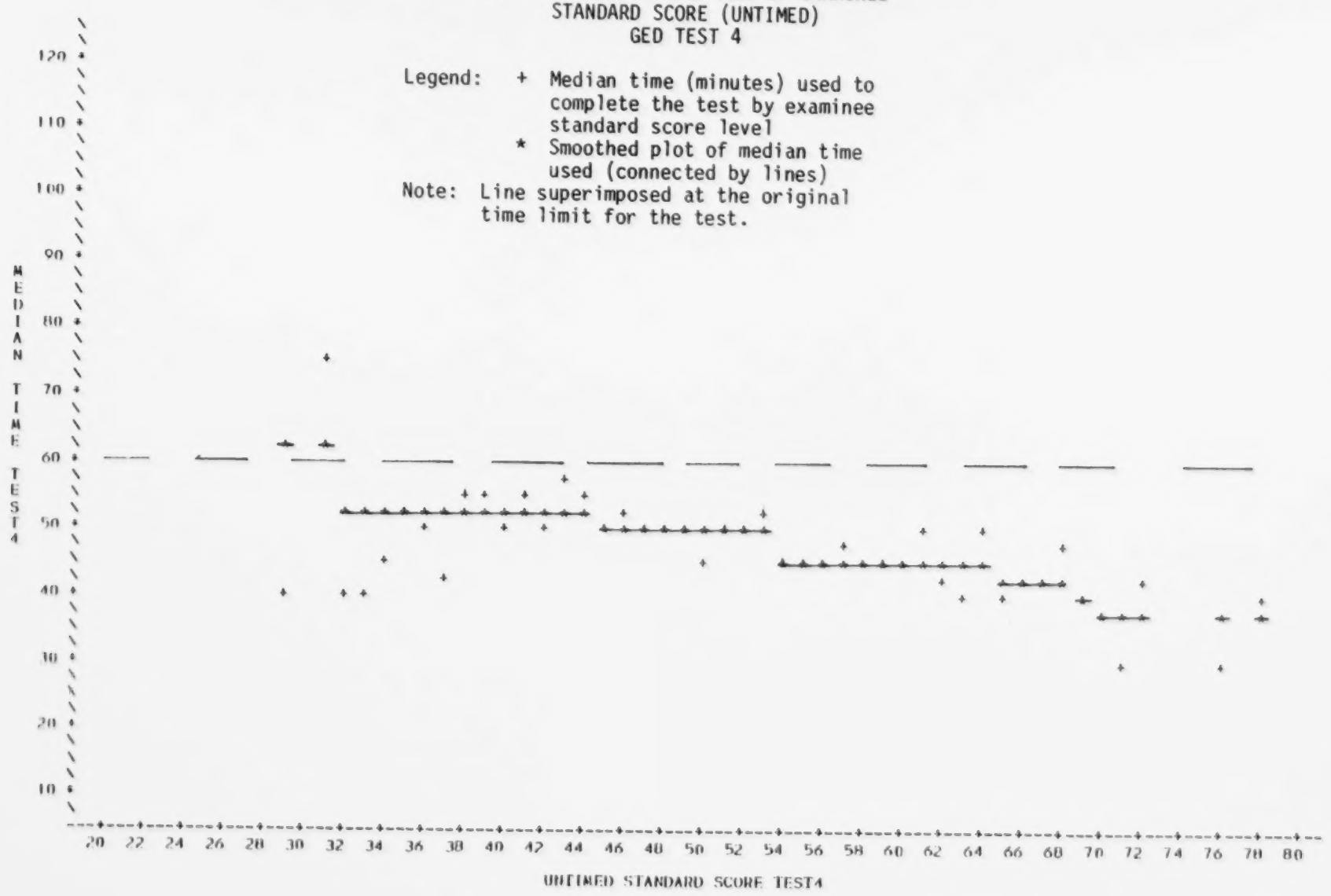


FIGURE C-5

PLOT OF MEDIAN TIME USED BY EXAMINEE
STANDARD SCORE (UNTIMED)
GED TEST 5

Legend: + Median time (minutes) used to complete the test by examinee standard score level
* Smoothed plot of median time used (connected by lines)

Note: Line superimposed at the original time limit for the test.

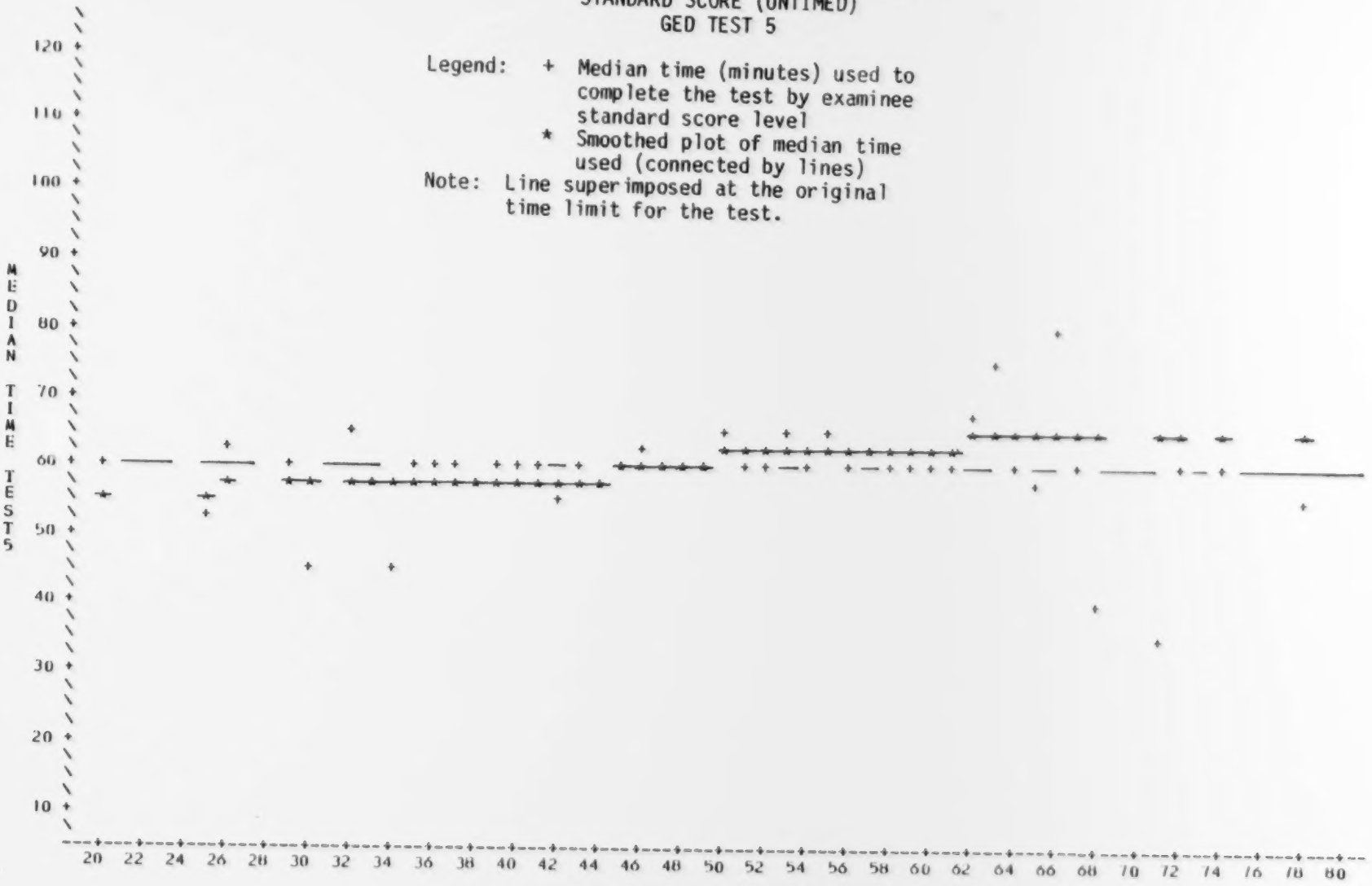
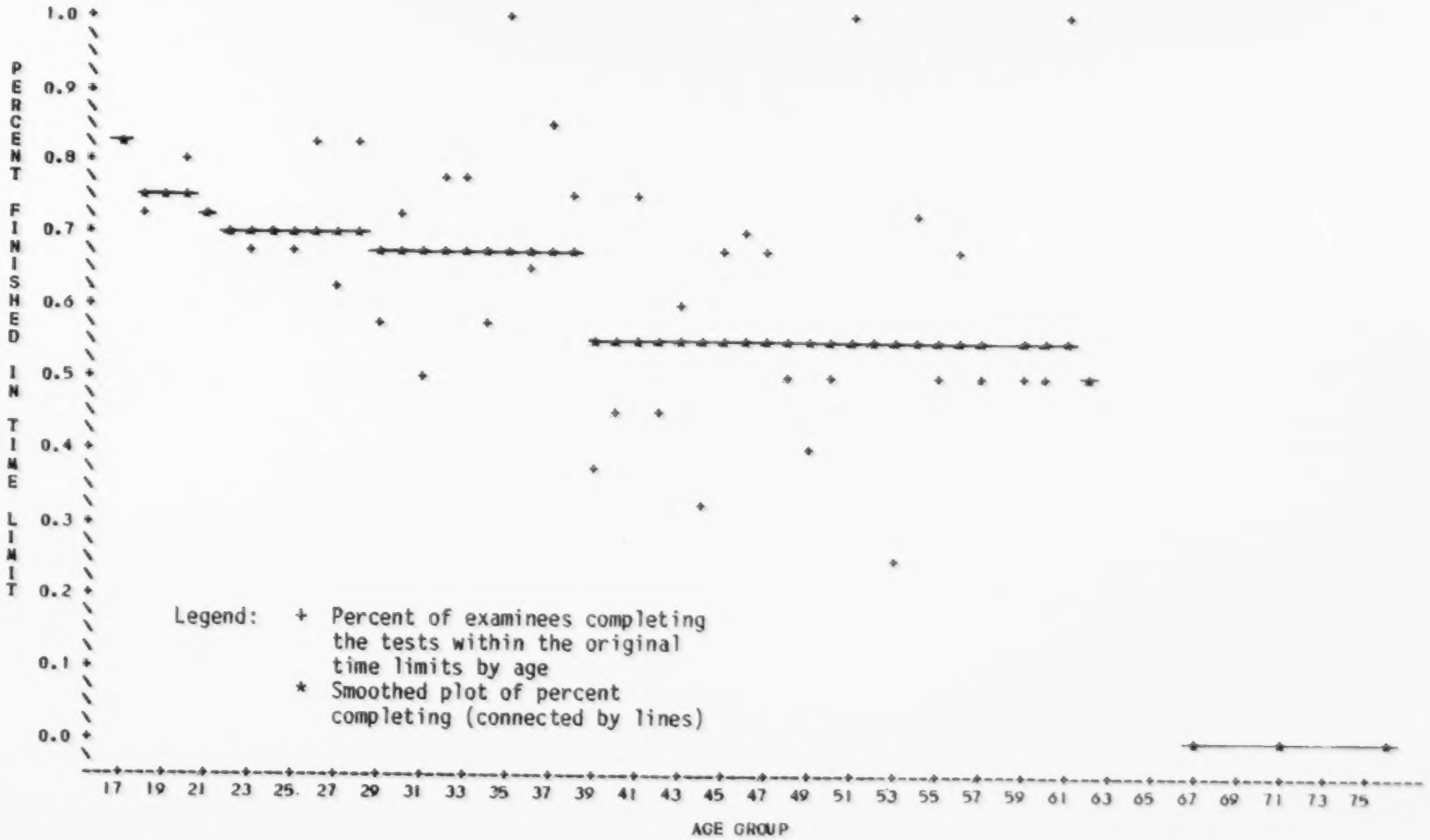


FIGURE D-1

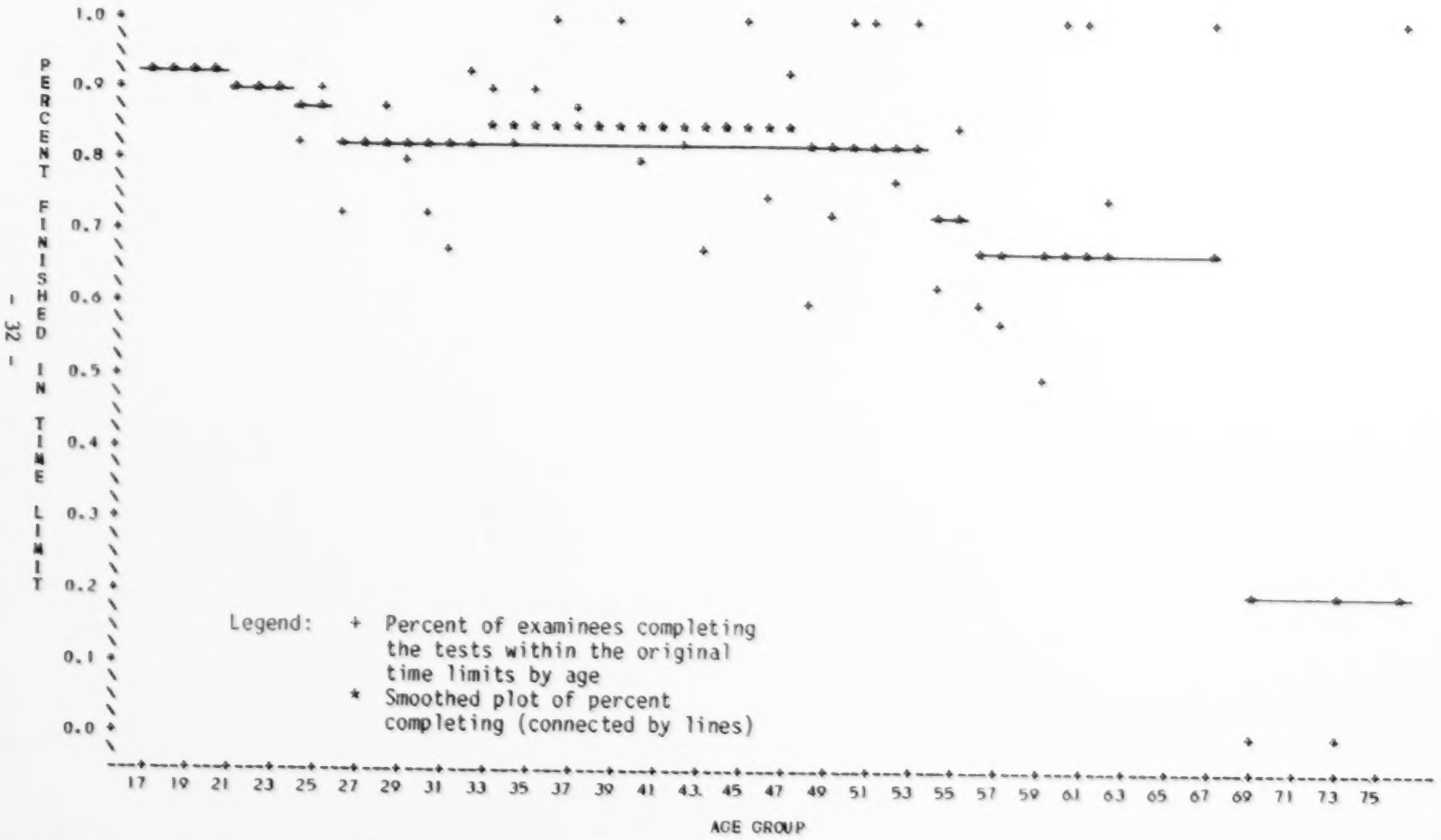
PLOT OF PERCENT OF EXAMINEES
COMPLETING THE TEST WITHIN
THE ORIGINAL TIME LIMITS
GED TEST 1


PERCENT FINISHED IN TIME LIMIT
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
Legend: + Percent of examinees completing the tests within the original time limits by age
* Smoothed plot of percent completing (connected by lines)
17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 57 59 61 63 65 67 69 71 73 75
AGE GROUP

NOTE: 7 OBS HAD MISSING VALUES OR WERE OUT OF RANGE

FIGURE D-2

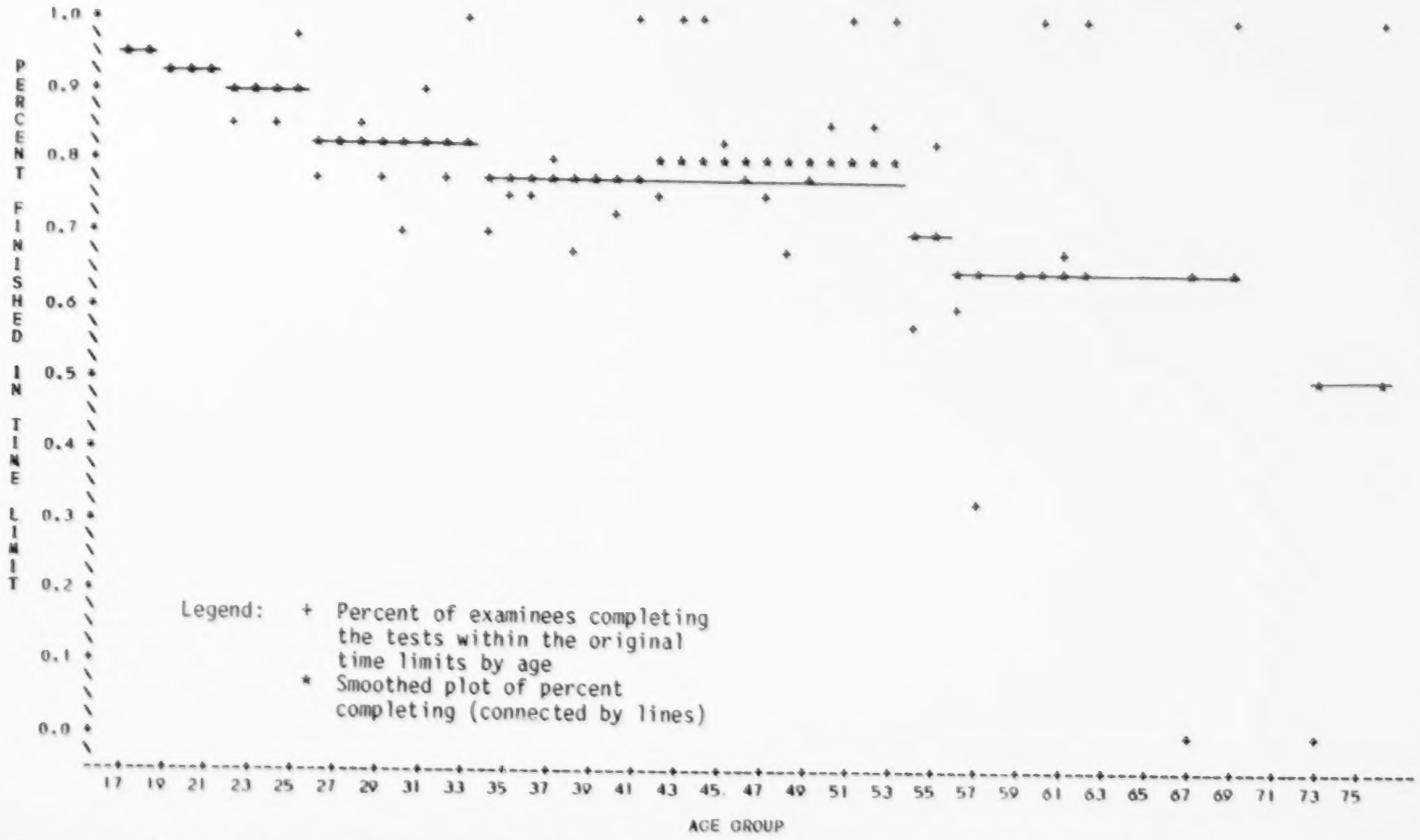
PLOT OF PERCENT OF EXAMINEES
COMPLETING THE TEST WITHIN
THE ORIGINAL TIME LIMITS
GED TEST 2


PERCENT FINISHED IN TIME LIMIT
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
Legend: + Percent of examinees completing the tests within the original time limits by age
* Smoothed plot of percent completing (connected by lines)
17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 57 59 61 63 65 67 69 71 73 75
AGE GROUP

NOTE: 5 OBS HAD MISSING VALUES OR WERE OUT OF RANGE

FIGURE D-3

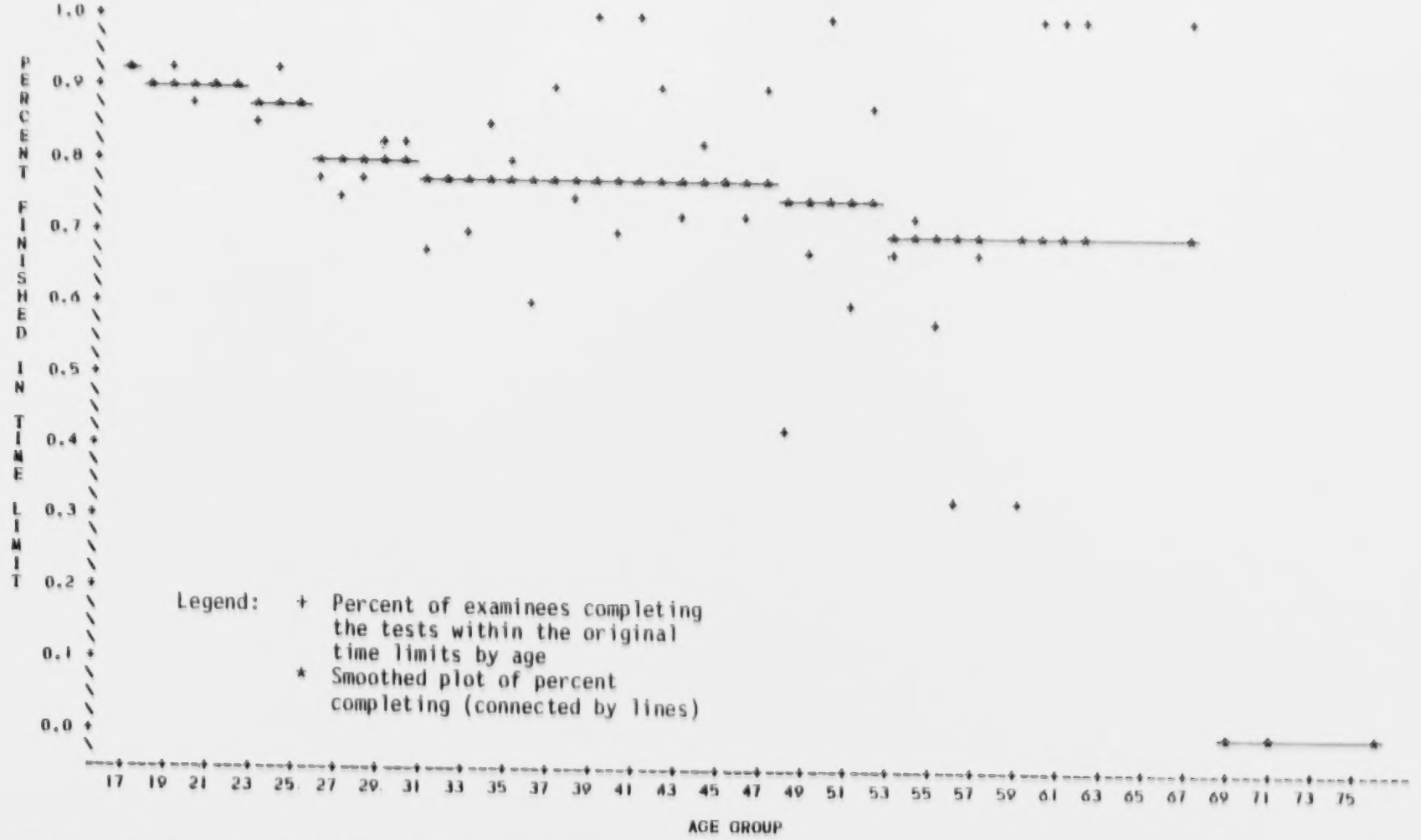
PLOT OF PERCENT OF EXAMINEES
COMPLETING THE TEST WITHIN
THE ORIGINAL TIME LIMITS
GED TEST 3


PERCENT FINISHED IN TIME LIMIT
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 57 59 61 63 65 67 69 71 73 75
AGE GROUP
Legend: + Percent of examinees completing the tests within the original time limits by age
* Smoothed plot of percent completing (connected by lines)

NOTE: 5 OBS HAD MISSING VALUES OR WERE OUT OF RANGE

FIGURE D-4

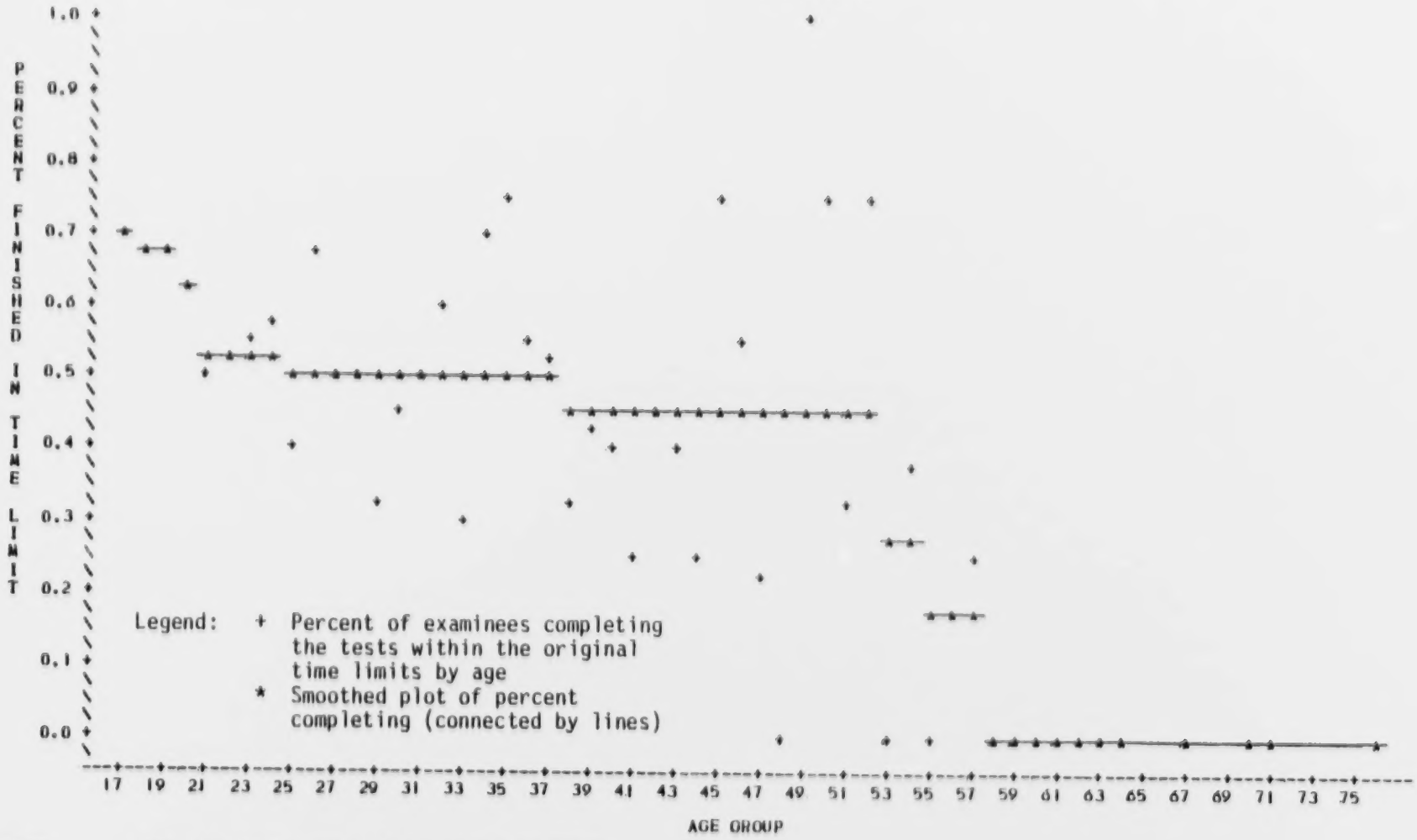
PLOT OF PERCENT OF EXAMINEES
COMPLETING THE TEST WITHIN
THE ORIGINAL TIME LIMITS
GED TEST 4


PERCENT FINISHED IN TIME LIMIT
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 57 59 61 63 65 67 69 71 73 75
AGE GROUP
Legend: + Percent of examinees completing the tests within the original time limits by age
* Smoothed plot of percent completing (connected by lines)

NOTE: 6 OBS HAD MISSING VALUES OR WERE OUT OF RANGE

FIGURE D-5

PLOT OF PERCENT OF EXAMINEES
COMPLETING THE TEST WITHIN
THE ORIGINAL TIME LIMITS
GED TEST 5


PERCENT FINISHED IN TIME LIMIT
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
Legend: + Percent of examinees completing the tests within the original time limits by age
* Smoothed plot of percent completing (connected by lines)
17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 57 59 61 63 65 67 69 71 73 75
AGE GROUP

NOTE: 3 OBS HAD MISSING VALUES OR WERE OUT OF RANGE

FIGURE E-1

PLOT OF PERCENT OF EXAMINEES
COMPLETING THE TEST WITHIN
THE ORIGINAL AND REVISED TIME LIMITS
GED TEST 1

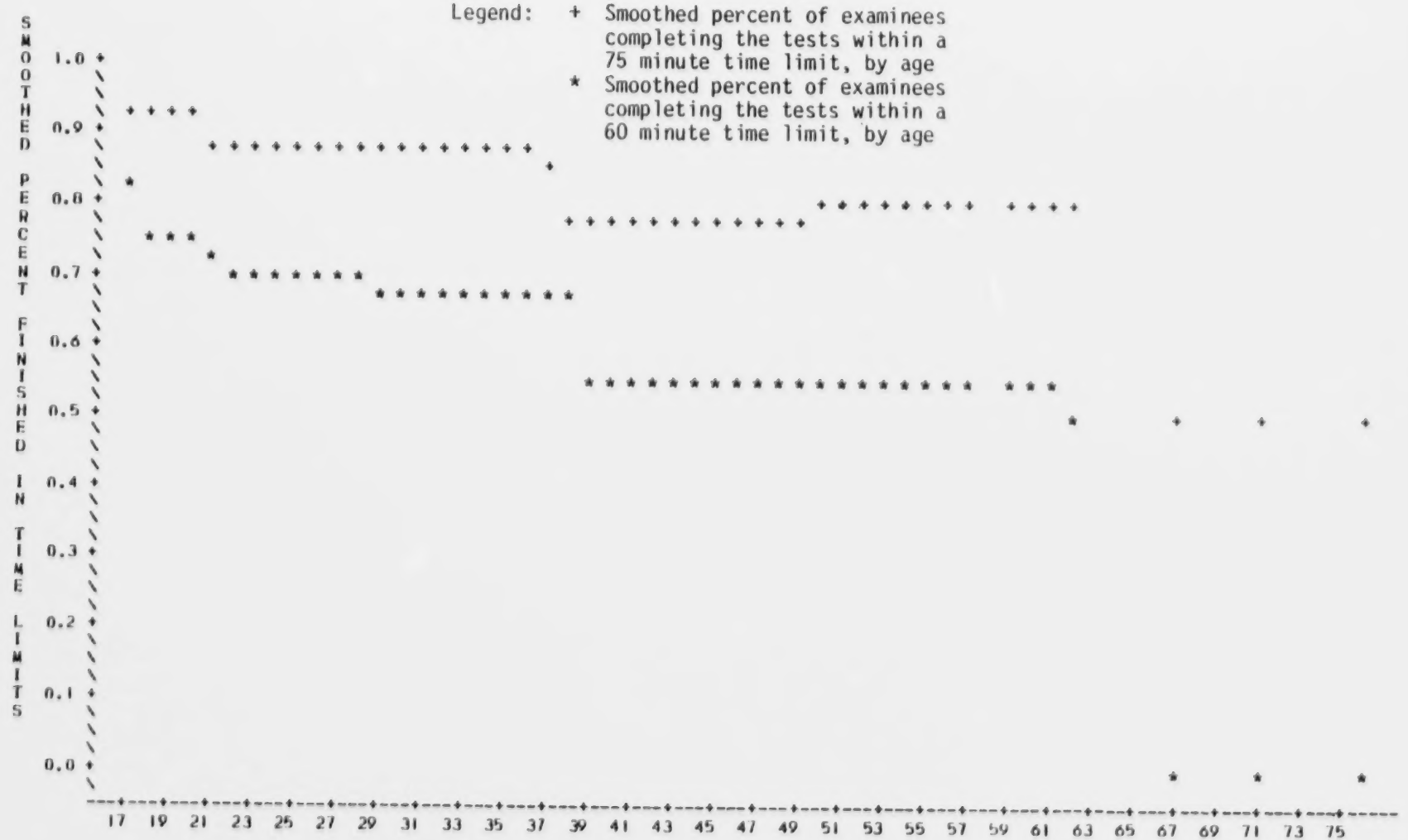
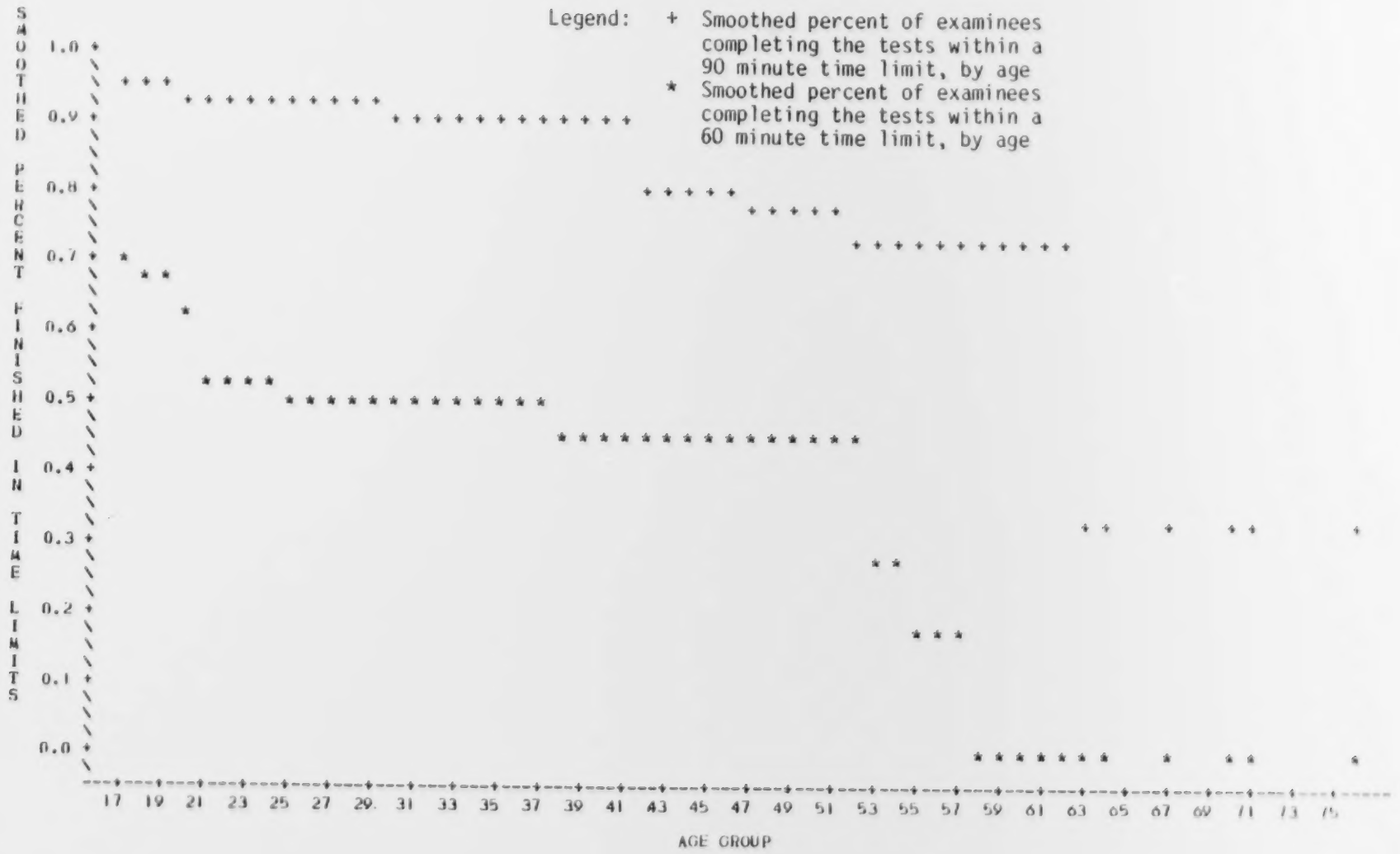

Legend:
+ Smoothed percent of examinees completing the tests within a 75 minute time limit, by age
* Smoothed percent of examinees completing the tests within a 60 minute time limit, by age
SMOOTHED PERCENT FINISHED IN TIME LIMITS
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 57 59 61 63 65 67 69 71 73 75
AGE GROUP

FIGURE E-2

PLOT OF PERCENT OF EXAMINEES
COMPLETING THE TEST WITHIN
THE ORIGINAL AND REVISED TIME LIMITS
GED TEST 5


Legend:
+ Smoothed percent of examinees completing the tests within a 90 minute time limit, by age
* Smoothed percent of examinees completing the tests within a 60 minute time limit, by age
SMOOTHED PERCENT FINISHED IN TIME LIMITS
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 57 59 61 63 65 67 69 71 73 75
AGE GROUP

GED TESTING SERVICE PUBLICATIONS
(See order information below)

*Who takes the GED Tests? A national survey of Spring 1980 examinees. (GEDTS Research Studies, No.1, 1981) The results of a detailed survey of nearly 13,000 recent examinees.

*The GED Annual Statistical Report. Contains data from each participating department of education and the GED Testing Service for testing conducted during each calendar year.

#Examiner's Manual for the Tests of General Educational Development. Policies and procedures under which the nationwide GED testing program is conducted, 1981.

The Final Report for a project to develop twelve new forms of the Tests of General Educational Development and to standardize the Tests nationally, 1978.

The GED Testing Program. Brochure of information about the nature and history of the tests and testing program.

Predictive validity of the GED Tests for two year college study South Plains College, Texas by J.C. Wolf. GED Research Brief No.1, March, 1980.

High school equivalency candidate performance on the New York state high school reading competency tests and on the GED Tests by C. Sonnenblick. GED Research Brief, No.2, August, 1980.

How useful are the Official Practice GED Tests and the General Educational Performance Index for predicting performance on the GED Tests? by W.J. Musgrove. GED Research Brief, No.3, March, 1981.

The success of high school diploma and GED equivalency students in vocational programs at Lake City Community College Florida by R.C. Wilson and others. GED Research Brief, No.4, April, 1981.

Marked (*) items are available at $2.50 prepaid; (#) items are available at $5 prepaid; single copies of the other publications will be provided free of charge while supplies last.

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